JPRS 75779

26 May 1980

USSR Report

AGRICULTURE

No. 1235

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MAJOR CROP PROGRESS AND WEATHER REPORTING

PROGRESS IN SPRING PLANTING

Krasnodarskiy Kray Status Report

Moscow PRAVDA in Russian 19 Apr 80 pp 1-2

[Report by E. Savonov]

[Excerpts] The time has come for mass planting in the principal grain-growing area of the Soviet Union. The steppe regions of the Northern Caucasus and the Ukraine are filled with the din of thousands of tractors. The day is not far off when the hard work of harvesting will be going on everywhere. In their efforts to implement the decisions of the 25th Party Congress and the July (1978) and November (1979) Plenums of the CPSU Central Committee, farmers are striving to obtain the maximum yields of grains and other crops, to preserve the harvest, and to deliver it on time to storage facilities and processing plants.

From the fields of the Kuban area, PRAVDA today begins publication of information on the socialist competition among workers in the agricultural-industrial complex for good end results in the final year of the five-year plan. Our correspondents will tell the story of the principal granaries of the USSR, relating how rural toilers, purchasing agents, and transport workers are striving to increase the production of grain, cotton, vegetables, feed grains, and other crops and to improve their quality and are seeking ways to increase the cost-effectiveness of kolkhozes and sovkhozes.

The plains of the Kuban, with their extensive grain fields, are astounding in their ability to rivet one's gaze. In spring, the lovingly cultivated land, black or clad in the gaudy green of seedlings gathering their strength, sprawls freely until hidden by the blue April haze on the far horizon. Around the chernozem are feelings of pride and joy and the age-old emotions and cares of the kray's grain producers.

There are 4.3 million hectares of arable land along the Kuban. About one-third is occupied by winter wheat, yields of which have in recent years been in the neighborhood of two hundred poods. On the whole, the residents of Krasnodarskiy Kray produce a significant share of Russian grain, hybrid corn and rice seed, sunflower seed, and so forth. To me, figures are not dull and cold when they accurately represent our national achievements and interests. Among other significant indices, the most important for Krasnoddarskiy Kray is 9.5-10 million tons of grain. That is the amount that must be produced by farmers in this, the final year of the 10th Five-Year Plan.

Krasnodarskiy Kray is now one of the largest suppliers in the Soviet Union of strong wheats that command high prices.

Virtually all the winter wheat raised along the Kuban is of strong varieties having outstanding production characteristics. Specialists know that they require precision agrotechnics, with the strictest possible observation of the proper times for field operations; the harvest must be organized in such fashion that the grain does not remain in windrows or on the threshing floor for even an extra hour, does not take up additional moisture, does not suffer from dockage, and is not delayed en route to the receiving point.

The Kuban region is acknowledged as the granary of Russia. However, its immense grain fields also seem to me to be a sort of a giant laboratory The kray is not afraid to set itself major tasks and to accomplish them innovatively. Not very long ago, the Kuban region was considered to be one of the most favorable areas of the USSR in terms of the extent of its weed flora. On entering the area today, one encounters the low-key but very eloquent inscription: "Kanevchane has freed its fields of weeds." This is true not only of Kanevchane but also of its neighbors and all other parts of the region.

Let us consider another subject, manure. It is no longer just from old farmers but also from science that we know that organic fertilizers increase yields of themselves and, when applied jointly with synthetic fertilizers, provide a considerable enhancement of soil fertility. In every district along the Kuban, special motorized groups haul manure to be applied at a rate of no less than 8-10 tons per hectare. Over the past year, 32 million tons of organic fertilizer was applied to the soil in the kray and it is planned to apply an additional 34 million tons to this year's harvest.

The present spring is once again presenting the farms of Krasnodarskiy Kray with complex problems. Obtaining a substantial increase in wheat production is only the first of the goals that has been set; others include surpassing the million mark in rice production, delivering 1.1 million tons (as against 774,000 tons last year). For the first time, 125,000 of the 300,000 hectares planted to corn in the kray will be cultivated on an industrial basis, carrying out interrow tillage solely with machines.

I asked what most disturbed machine operators and my conversations generally did not deal with anything immediate, pertaining to the spring season; there are no special difficulties there. If something does not turn out just so in the field, the guilt and blame belong to no one else. When the grain ripens, operators will do their utmost, but the upshot may not always be what they desire. There are no high-capacity grain combines that can handle the harvests of the Kuban region. The Niva combine was essentially designed for grain yields of 20-30 quintals and must be run in first gear at low speed on the farms of Krasnodarskiy Kray, in order to avoid spoilage and wastage. This means that the grain from only 8-9 hectares can be delivered for threshing each day. On the other hand, the kray's combine fleet includes many obsolete, low-output machines. Transport is not adequate either.

However, the grain growers of the kray also have some resources. Yields are still spotty on adjacent farms and in neighboring districts and technology is not always utilized in the best possible manner; it would help for farmers to be more enthusiastic about fertilizers. The primary factor, however, is labor: there is a need for a solicitous attitude toward workers and the ability to inspire them to new and greater efforts. The party organization of the kray and every party member will have to work at this.

The problems outlined above are of vital importance for the Kuban region: they dictate the quality of life and the level of grain production and will undoubtedly have to be solved more rapidly. This also is the import of the call of spring, with its intense labor, human hopes, and solid belief in success.

Rostovskaya Oblast Status Report

Moscow IZVESTIYA in Russian 23 Mar 80 p 1

[Article by V. Goncharov]

[Excerpts] The main task confronting workers in the fields along the Don in this anniversary year, the final year of the 10th Five-Year Plan, is to produce 8-9 million tons of high-quality grain, to prepare and deliver feeds, and thus to increase the output of meat, milk, and other products.

There are dozens of agricultural districts along the Don. Each has its own working plans for spring. However, they all share a number of common responsibilities: making calculations, selecting field-operations strategies, and preparing farmers for the coming season.

There is, for example, Oktyabr'skiy Rayon. A complex plan has been worked out for spring field work, providing for an increase in utilization of the machinery and tractor fleets, introduction of new technical services, and improvement of the organization of machine-operator time so as to ensure that harrowing is completed within 24 h and cultivation within 36 h. Sowing of early grains and legumes will be finished within 50 working hours. Fertilization of the seedbeds has been completely mechanized. A total of 36 drills will be in operation on the rayon's fields during the spring field-work period.

The farmers of the Don region have been prepared to obtain the highest possible yields for all crops during this final year of the five-year plan.

They know that the nation expects large amounts of grain, a major contribution to the overall grain supply, from them.

Orlovskaya Oblast Status Report

Moscow IZVESTIYA in Russian 14 Mar 80 p 1

[Article by I. Agarlov, assistant editor of ZVEZDA and member of the Maloarkhangel'skiy Rayon People's Control Committee, E. Krasil'nilova, kolkhoz worker and member of the People's Control Group of the Kalinin Kholkhoz, V. Lebedev, machine operator and member of the People's Control Group of the Oktyabr'skiy Sovkhoz, M. Parshikov, inspector for the Oblast People's Control Committee, and S. Troyan, IZVESTIYA correspondent]

[Excerpts] The farmers of Maloarkhangel'skiy Rayon have learned much this past year. Yields at the leading farms, where all opportunities were grasped, were greater by a factor of 1.5 than the average for the rayon. Those who compiled the rayon's accounts at the end of the year found that winter crops made a major contribution. That is why, when it came time to plant in autumn, the area planted to winter crops was expanded by one-third. It now amounts to 16,000 hectares. Sowing was carried out quickly and was of high quality.

The farmers of Orlovskaya Oblast have to sow more than 600,000 hectares of spring grain crops. About 32,000 machine operators will be coming to participate in the spring harvest. The goal has been set of carrying out sowing with only two shifts: sowing is to be rapid and of high quality, while observing all agrotechnical requirements. The various implements needed for spring sowing are now being fabricated under watchful eyes. All this will aid in improving field-work productivity and quality.

The farmers of the oblast have committed themselves to producing 20 quintals of grain per hectare. It is planned to sell 730,000 tons to the government. These are high but achievable goals. One guarantee of success is the well thought-out working plans for spring sowing that every farm should have.

Sowing in Uzbekistan

Moscow IZVESTIYA in Russian 13 Mar 80 p 1

[Tass dispatch]

[Excerpts] Tashkent--Massive sowing of grain crops has begun on the farms of Uzbekistan. Hundreds of drills have gone into the fields in Andizhanskaya, Ferganskaya, Kashkadar'inskaya, and Surkhandar'inskaya Oblasts, where the sun has already warmed the soil. This season, 90,000 hectares in the Republic will be occupied by spring grain crops, which is 10,000 more than last year.

The grain grower's arsenal has been augmented by new regionally approved varieties: Krasnovodopadskaya-210 wheat and Sholpan barley. Tests have shown that they can provide large grain yields, more than 20 quintals per hectare, under drought-prone dryland conditions. These varieties have made it possible to extend the grain-growing area into the foothill zone of Zaaminskii Rayon.

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CSO: 1824

MAJOR CROP PROGRESS AND WEATHER REPORTING

CROP PEST FORECAST FOR 1980

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 4, Apr 80 pp 44-45

[Article by V. Belov and I. Gayvoronskaya: "The Prevention of Massive Crop Destruction"]

[Text] The production of chemical and biological means for plant protection and the technology for their application increases every year. But to a large degree the phytohealth condition of the crops and the harvest yield depend on the quality and timely application of the agrotechnical, chemical and biological techniques. However, the need for a given method and substance should be determined only after a detailed study of each field, orchard, and garden, necessarily taking into account the economic threshhold of the strength of the various pests and the useful activity of entomophages. The prognosis for the major agricultural crop pests and diseases for 1980 will help agricultural specialists determine and simultaneously take measures against these pests and diseases.

Keeping in mind the ecological characteristics of last year, we will examine the supposed distribution of the major, most dynamic and harmful phenomena this year.

Gophers. They will be most prevalent in the Volgogradskaya, Kuybyshevskaya, Astrakhanskaya, Rostovskaya, Orenburgskaya oblasts, Kalmytskaya ASSR, in the Altay Kray. The major means of combatting these is the surface application of grain traps with zinc phosphide or glyphtor. Ammonia water can be also used successfully.

Rodents. An increase in their number has been noted in Krasnoyarsk and Staropolsk krays, in the Voronezhskaya, Belgorodskaya, Gor'kovskaya, Bryanskaya, Moskovskaya oblasts as well as in the Mordovskaya and Chuvashkaya ASSR. The major means of combatting these are grain traps with zinc phosphide and bacterodencite. Bacterial methods for mice are recommended for those areas where a distribution of poisoned traps is dangerous to useful wild as well as domestic animals. A haystack may be treated with ammonia water by means of a special device developed by the All-Soviet Institute of Feed (see SEL'SKOYE KHOZYAYSTVO ROSSII No 9, 1979).

Locusts. The greatest concentration of the Asian locust last year (up to 1000 per hectare) was reported on the border of the Astrakhan Oblast and the Kazakhskaya SSR. This year it is possible that it will increase. A greater distribution of the Italian cockroach is expected in the Astrakhanskaya, Orenburgskaya, Chelyabinskaya oblasts, Kalmytskaya ASSR, Altay Kray. The greatest damage by nonswarming locusts is most likely to occur in the territories of Siberia and Bashkirskaya ASSR.

Against these pests the following pesticides should be used: 12 percent hexachlorocyclohexane, metaphos and chlorophos.

Gnawing cutworm. Last year a wider distribution of the breeding grounds of the winter and the calling cutworm was noted in the Central Chernozem Region and in the Northern Caucasus. Keeping in mind the fact that in most of the regions the older caterpillars went into hibernation in good physical condition, it is possible that 1980 will see an increase in the area affected by these insects. Their local appearance is possible in the Central, the Volgo-Vyatskiy rayons and in the Povolzhe. Breeding grounds of this pest are preserved in the Urals, in Eastern Siberia and in the Far East.

Leaf-Eating Cutworm. This year the cabbage cutworm will have a wider distribution in the regions of the Central zone, the Central Chernozem Region, the Northern Caucasus, the Urals, Siberia and the Far East.

Last year a series of grass-cutworm breeding grounds were identified in the central zone and in the northwestern zone. Here a further increase is most probable. An increase in the cotton cutworm can be expected in the autonomous republics of the Northern Caucasus and in the Staropol'skiy Kray.

The battle against the cutworm should include the whole complex of agrotechnical, chemical (use of phosphoro-organic preparations) and biological (the application of trichogram on the egg-laying grounds of this pest) methods.

Meadow Moth. This is one of the most dangerous pests. The caterpillars consume many times their own weight. Great harvest losses due to the massive reproduction of the meadow moth are especially common in sugar beet, corn, sunflower, vegetable and melon crops. The caterpillars also destroy one-year old and older legumes, hemp, and more rarely, grain crops. Relatively optimal ecological conditions for the development of the meadow moth now exist in various rayons of the Northern Caucasus and Siberia. The winter breeding grounds of the pest are preserved primarily on unplowed land (virgin pastures, forests, edges of fields, areas of older grasses). Although in 1975 the numbers of the meadow moth decreased, the potential danger of their reappearance is great due to the wide distribution of the caterpillar and the high mobility of the butterfly. The first generation meadow moth breeding grounds are most likely to appear in the Northern Caucasus, in the Povolzhe and in various rayons of Siberia. The possible methods of combatting this pest are described in the April 1978 issue of SEL'SKOYE KHOZYAYSTVO ROSSII.

Stem Moth. In 1980 local breeding grounds of this pest can be expected in the hemp, corn, millet crops of the Northern Caucasus and the lower Povolzhe.

It is expected that grain fleas, grain flies, leeches, and aphids will show up on the grain crops, while the major pest in the zone of the Northern Caucasus, the Povolzhe and the Orenburgskaya Oblast will be the harmful chinch bug.

On the basis of distribution data, conditions of development and the physiological state of the population, it can be proposed that the application of chemical preparations against the larvae must be done to the same extent as in 1979. In the spring this will also prevent winter wheat from being affected by the grain carabus.

Gray Grain Cutworm. Autumn studies have shown that in the Bashkirskaya ASSR, Chelyabinskaya and Omskaya oblasts, the average density of dormant caterpillars has increased by 3 to 4 times. Their physical condition is good. Therefore, we should be prepared for an onslaught of this pest.

As last year, plantings of leguminous plants and perennial grasses will be subject to tuber weevils and clover and alfalfa seed-eaters. Under favorable weather conditions during the flowering and growth of legumes (the combination of temperate warm weather with average or above-average humidity) the destruction by pea aphids will be great and this demands chemical control.

On sugar beet plantations, the leaf-miner flies will be prevalent. Their massive spread took place last year in the Non-Chernozem Region, in the Povolzhe, in the Central Chernozem Region and in Western Siberia. The harmfulness of the fly increases with the first generation. But this is not to exclude significant damage to the crops by the larvae of the second generation. A decrease in the population and harmfulness of the flies can be achieved by the correct application of agrotechnical techniques and the timely use of chemical preparations. According to the data of the All-Soviet Scientific Research Institute of sugar beets, anthio- and chloro-phose are most toxic to the larvae of the second generation leaf-miner fly.

In dry and warm weather there will be increased damage from the sugar beet flea and in warm and humid weather, from the sugar-beet leaf aphids.

In all areas of sugar-beet crops, root rot will be prevalent. The increase in the damage due to this disease is often the result of planting on hard soil, which leads to the fattening and the development of the skin, and the use of low-quality seeds.

The farms of the Northern Caucasus zone should be prepared to protect the sugar beet from cercosporella infection, since the present potential of infection presents a danger in the further spread of the disease. In the major sugar-beet raising regions there is also the possibility of spreading peronosporella. Farms should do preventive spraying with cineb, copper or polycarbocine oxychloride, or a combined preparation of chomecine.

Under warm and wet summer conditions in all flax producing regions, one expects the flax disease, plant rust. It will be most threatening to the T-9, T-10, Spartak, 8063 types. Anthracnose, polysporella and bacteriose will also be found.

The major potato pest is the Colorado beetle. The weather conditions of the autumn favored good wintering for the bettles. Therefore, high viability is expected everywhere in the spring. An increase is expected in Kaliningradskaya, Pskovskaya, Smolenskaya, Vladimirskaya, Ivanovskaya, Kaluzhskaya, Moskovskaya, Gor'kovskaya, Kuybyshevskaya, Ulyanovskaya oblasts, in the Mordovian, Chuvash, Bashkir and Tatar ASSR. An increase in beetle activity may take place also in the Orenburgskaya, Kurganskaya and Chelyabinskaya oblasts.

Phytophtor. In 1979 the disease covered all potato-growing regions. Much crop destruction is likewise expected this year.

It is recommended that the potato crop be treated with a mixture of polychlorpinene with cineb or cyram, chlorophos with copper oxychloride or cineb, or cyram. This technology allows us to cut by 1.5 or half the cost of the treatment while not reducing its effectiveness.

The stem nematode will appear everywhere and in many oblasts the potato nematode will also show up. A wide distribution of viral diseases has also been reported. Their destructiveness will not decrease; therefore, it is important to do two or three applications of fungicide on potato crops. In areas of most intensive Cruciferae crop growing of the vegetable diseases, one expects an increase in blackfoot, false mildew, cabbage kill and onion perosporella.

The major fruit pest will be the lesser apple worm (codling moth) and the disease scab.

In order to protect the environment and to guard against the occurrence of pesticides in fruits and vegetables, the biological techniques (trichogram, phytocellulose, microbiopreparations) should be more widely used and only in the case of a severe infestation should chemical treatments be used, and these with strict adherence to the recommended safe dosages.

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MAJOR CROP PROGRESS AND WEATHER REPORTING

CROP PROGRESS REPORT ON TADZHIK SSR

Moscow SEL'SKAYA ZHIZN' in Russian 23 Apr 80 p 1

[Article by K. Madaliyev, correspondent]

[Excerpts] The unusually cold spring and long period of inclement weather caused the farmers of Tadzhikistan to worry considerably. They had to make changes in the work plans, juggle the equipment, watch for and make efficient use of literally each hour of good weather.

For this reason, the sowing pace was irregular in April, and they had to catch up for lost time. Mukhitdin Zoirov, minister of agriculture of this republic, told us: "There are a number of distinctions to this year's planting: The Ipatov method of organizing labor is being used more and more. For this first time, 5,500 sowing machines were used in the mechanized units."

There has been an increase of 7,640 hectares in area planted with cotton as a result of reclamation of virgin land, and the total constituted 305,000 hectares. This includes 105,000 hectares of the most valuable thin-fiber cultivars. This is 21,000 hectares more than last year. Cotton plants with the first type of fiber have been planted on 2,000 hectares more fields. There, it is primarily the highly productive ASh-25 and 8-6037 cultivars that were used. A new variety, Druzhba-60, developed in Tadzhikistan and assigned to rayons this year, has appeared in the industrial fields.

Finally, mention must be made of the more intensive use of irrigated fields. In this republic, winter-vegetating rape and "perko" plants were sown over an area of 11,200 hectares after harvesting corn and with growing cotton plants. In the spring, these crops yielded 200-250 centners each of excellent fodder per hectare. Then in April, these fields were plowed and planted with cotton and corn. The experiments were a great success. In the fall, it is planned to expand considerably the area planted with perko and rape.

Specialists at the Ministry of Agriculture reported that there has been considerable expansion of the area occupied by wilt-resistant cotton cultivars. In particular, Regar-1 and Regar-34 have been planted over twice the area occupied last year.

The sowing machines have left the fields. Thin lines of seedlings have outlined the cotton fields. Where they are slow in sprouting the farmers are providing additional water. Between-row tilling has been deployed at many farms in the Vakhshskaya and Gissarskaya plains, Leninabadskaya and Kulyabskaya oblasts. Hundreds of machines are fighting with the soil crust that appeared after the torrential rains and really summer-like heat. On some days in April the temperature there reached 30-33 degrees. The next jobs are to thin the plants, straighten out the clumps, give the first feeding and vegetation watering. In a word, the great cotton conveyer has begun to move.

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CSO: 1824

FIELD WORK PROGRESS AND SNOW-MOLD DAMAGE IN BELORUSSIA

Snow Mold Control

Minsk SEL'SKAYA GAZETA in Russian 12 Apr 80 p 3

[Article by V. Samerov, director of the Belorussian Scientific-Research Institute of Plant Protection; and S. Buga, supervisor of the Phytopathology Laboratory: "Attention: Snow Mold"]

[Text] One of the causes of mortality in winter crops is snow mold. Plants infected by this organism exhibit low spring regrowth activity and their lateral shoots are underdeveloped and often die. Experiments conducted at the institute established that the reduction in yield can amount to 21 to 26 percent for winter rye infected with snow mold to a moderate extent (2 points) and reaches 62 percent when the degree of infection is severe (3 points); all the plants die when infection is severe enough to rate a score of 4 points.

Signs of mold infection can be detected in early spring, after the snow melts. Serous greenish-brown spots appear on the plants and a cobwebby bloom that is gray at first and subsequently turns pink is formed, causing the leaves to stick together. They lose their green color, decay and die. Snow mold spreads to a greater extent when the affected plants are weakened, e.g., by lack of heat during the autumn, snowfall on thawed soil, or a thin frozen soil layer. Favorable conditions for the pathogen include a prolonged (more than 100 days) and deep (more than 30 cm) snow cover, frequent long warm spells, and a protracted spring with intermittent cold periods.

Mortality among winter crops is most frequently observed on farms where the fields exhibit little contouring, in plantings surrounded by forests, and in depressions where the snow lasts longest.

This year's spring has been protracted and cold. The snowmelt was followed by cold weather with frequent fogs and precipitation promoting snow-mold development. As a result of these conditions, the status of winter crops can change from day to day.

Daily checks must therefore be made of fields that are in satisfactory condition.

It is anticipated that the extent of snow-mold infection will be slight in most rayons of the southern zone (Gomel'skaya and Brestskaya Oblasts, except for Baranovichskiy, Gantsevichskiy, and Lyakhovichskiy Rayons) and moderate in Minskaya, Grodnenskaya, and Mogilevskaya Oblasts.

There is particular anxiety over the status of plantings in many rayons of Vitebskaya Oblast (Gorodokskiy, Rossonskiy, Verkhnedvinskiy, Polotskiy, Postavskiy, Sharkovshchinskiy, Vitebskiy, Lioznenskiy, and Tolochinskiy Rayons), as well as in Volozhinskiy, Minskiy, and Bileyskiy Rayons of Minskaya Oblast and Lidskiy, Slonimskiy, and Novogrudskiy Rayons of Grodnenskaya Oblast.

An inventory of planting status is necessary in order that timely and proper care of winter-crop sowings can be organized and the areas suitable for reseeding can be identified. For this purpose, the plants are counted in the field by laying out 50 x 50 cm squares at sites typical with respect to location or stand density. The viability of the plants is determined (a procedure particularly recommended for Vitebskaya Oblast) by raising them in water or sugar syrup or by staining them with tetrazole.

In staining with tetrazole, 50-60 plants are taken from two adjacent rows and washed; the roots are trimmed in such fashion that the root-system segment from the tillering node to the point where the cut is made equals 3-4 cm. The trimmed tillering nodes are placed in a beaker containing a 0.5 percent tetrazole solution. The solution level should be 1.5 cm above the plant. The plants are held in the solution for 4 h (at room temperature) or 1 h (in an incubator providing a warming factor of 40°). They are then removed from the solution and the percentage of live plants is determined. Thus tillering nodes that are stained raspberry-red are considered to be alive. Dead nodes do not stain.

When the snow cover is deep and winter-crop plantings are covered by an ice crust, the thawing of the ground must be speeded up by covering the surface of the field with peat meal at a rate of 2 tons per hectare. This technique should be most widely used in areas where the soil has not yet thawed (Vitebskaya Oblast). The ice crust can also be eliminated by application of potassium fertilizers (1-2 quintals per hectare). The meltwater must be disposed of and the winter crops top dressed with nitrogenous fertilizers within a short time. The plantings are harrowed as soon as the soil has dried out somewhat and no longer has a pasty consistency.

Proper implementation of spring care measures will ensure recovery of plants partially damaged during the overwintering period and have a favorable effect on the subsequent development of winter grain crops. Plantings that will not permit fulfillment of socialist obligations should be reseeded at the optimum time.

Coping With Delayed Planting

Minsk SEL'SKAYA GAZETA in Russian 18 Apr 80 p 2

[Announcement]

[Text] Farmers! The planting situation created by the lateness of spring requires that:

--the work period must be compressed, which necessitates exceptionally effective organization of labor in all stages of sowing, highly-productive, double-shift utilization of equipment, first-class performance of all operations, and use of the best agronomic practices;

--the top dressing of winter and perennial crops with mineral fertilizers be carried out as rapidly as possible so that those portions of the crops that have been subjected to flooding and snow mold and will not give the planned yields be shared with other crops or reseeded;

--all organic and mineral fertilizers procured for the spring sowing be applied to the soil within as short a time as possible and with maximum efficiency;

--all spring grain crops be planted within 5-6 days, sugar beets, flax, and root-type fodder crops within 3-4 days, and potatoes within 8-10 days.

Field Status

Minsk SEL'SKAYA GAZETA in Russian 18 Apr 80 p 2

[Announcement: "Attention Agricultural Workers"]

[Text] Specialists from the Republic Ministry of Agriculture and scientists have inspected the winter-crop fields. The results of this inspection show that rye and wheat have basically wintered well and have begun the vegetation stage in the southern rayons. However, winter-crop mortality has occurred over small areas. The fields to be reseeded must be incorporated into the spring sowing plan and must be sown with spring crops at the optimum times and in the best possible manner.

Moreover, seedlings infected with snow mold have been detected in a number of rayons in the central portion of the Republic and especially in northern areas. Farm specialists must make daily inspections of each field occupied by winter grains and, when necessary, take immediate measures to control this dangerous plant disease. In those cases where they do not have the requisite effect, the fields should be replanted with spring crops at the optimum time.

Snow Mold Inspection

Minsk SEL'SKAYA GAZETA in Russian 12 Apr 80 p 1

[Article by T. Shul'ga from Slonimskiy Rayon]

[Text] The workers at the Pobeditel' Sovkhoz have resolved to produce 35 quintals of rye per hectare this year. It is difficult to say whether they will be able to do so. This is due to the fact that considerable areas planted to winter crops have been damaged by snow mold. The disease is particularly rampant in fields located near brushy areas and shelter belts. Science and advanced practice recommend early-spring harrowing and top-dressing of plantings to control the disease. The soil has dried out to some extent in many places and selected areas could be harrowed; however, Chief Agronomist M. Akulich has postponed this operation.

The situation is precisely the same at the Bol'shevik Sovkhoz. However, neither Sovkhoz Director A. Dobriyan nor Chief Agronomist D. Sakhon' have as yet inspected the winter-crop sowings. Snow mold has infected sowings at the Pobeda, Krasnaya Zor'ka, Dzerzhinskiy, and Mizhevichi Kolkhozes.

Not even Chief Agronomist K. Svib of the Agricultural Administration of the Rayon Executive Committee has information on the extent to which winter-crop plantings have been affected by snow mold.

This lack of concern may result in substantial harvest losses for the farms of the rayon.

Status Report

Minsk SEL'SKAYA GAZETA in Russian 17 Apr 80 p 1

[Text] Spring grain crops have been planted on 44,000 hectares; one million tons of organic fertilizers have been applied; winter crops have been top-dressed over an area of 218,000 hectares; aerial application of mineral fertilizers has been carried out on 205,000 hectares.

2478
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MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

CHUVASH PROGRESS REPORT--Cheboksary (TASS)--The schedule for sowing work is broken down for every hour, and it is gaining momentum in the Chuvashskaya AR. Work by the Ipatov method is helping the crop growers to make up the time lost because of the late spring. The workers at the Pobeda Kolkhoz are giving an example of shock work, when they decided to complete the sowing of early grain crops by May Day. Field work is also being done by means of a continuous sowing conveyer at the Znamya, Gvardeyets, Rodina kolkhozes and other farms in the republic. [Text] [Moscow IZVESTIYA in Russian 29 Apr 80 p 1] 10,657

REPORT ON MARYYSKAYA, CHARDZHOUSKAYA OBLASTS--Ashkhabad (TASS)--The farmers of Maryyskaya and Chardzhouskaya oblasts have begun to irrigate the cotton plantations. Taking advantage of the good water conditions in Murgab, Tedzhen and Amu-Dar'ya, the irrigators have created a guaranteed stock of water. More than 1.6 billion cubic meters of water has been accumulated in 17 artificial reservoirs. The cotton plants will be irrigated 6-7 times over the vegetation period. Wise use of water is attributable to progressive irrigation methods. [Text] [Moscow IZVESTIYA in Russian 29 Apr 80 p 1] 10,657

REPORT ON STOLINSKIY RAYON--Brest (TASS)--Sowing work is in full swing on the fiels of Stolinskiy rayon, while preparation of harvesting equipment is already in progress in the maintenance shops. All of the machines will be operated in two shifts during harvesting. A sufficient number of machine operators has been prepared for this job. [Text] [Moscow IZVESTIYA in Russian 29 Apr 80 p 1] 10,657

REPORT ON SARATOV--Saratov (TASS)--The crop growers of Saratov are applying mineral fertilizers together with wheat seeds. The farmers decided to use this agronomic operation this season over a considerable area of Saratovskaya Oblast. At the present time, 1400 sowing complexes have been created at the farms. In most of them, mechanized elements have been organized for applying the fertilizer. [Text] [Moscow IZVESTIYA in Russian 29 Apr 80 p 1] 10,657

REPORT ON TUL'SKAYA OBLAST--Tula, 23 Apr (item by Ya. Osipchuk, foreign correspondent of SEL'SKAYA ZHIZN'--Supplemental feeding of winter crops and perennial grasses has been organized at the farms of this oblast, particularly in Alesinskiy, Venevskiy, Yefremovskiy, Uzlovskiy and Shchekinskiy rayons. The pilots in the agricultural aviation are now helping the farmers. There are 25 aircraft crews working over the fields of this oblast. The aviators will have to deliver food to 246,000 hectares of crops. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 24 Apr 80, p 2] 10,657

REPORT OF CHERNOMOR'YE REGION--item by A. Soldatskiy (correspondent of SEL'SKAYA ZHIZN') Odesskaya Oblast--This year, spring did not rush to arrive in the Chernomor'ye region. Even the old time residents do not remember a time when snow, accompanied by thunder, fell in the middle of April. But the farmers at the Tatarbunary Kolkhoz imeni Dimitrov managed to withstand the tribulations of inclement weather. They succeeded in squeezing in the "clear spots" in April, literally snatching moments between rains and prepared the soil in a very few hours. As a result, they planted 1200 hectares of early grain crops and feed mixtures. And it is not only at the Kolkhoz imeni Dimitrov that the steppe was filled with the roar of engines. At the present time, almost 1000 tractors are driving out to the fields on warm sunny days, and the local machine operators were among the first in this oblast to finish planting spring grain crops. Now work is proceeding at full swing to prepare the soil and plant later ripening crops. Special attention is being given to corn, which will occupy more than 10,000 hectares. The farmers of Tatarbunary are struggling to obtain 32 centners of grain per hectare. The work in the fields is being performed in a complex manner, on a tight schedule and equipment is being used around the clock. The farmers are hurrying. Springtime does not allow for any postponement. There is still much to do to succeed in fulfilling the great obligations of harvesting 3495 tons of grain and selling at least 1,500,000 tons of it to the state, including 333,000 tons of valuable wheat. [Excerpts][Moscow SEL'SKAYA ZHIZN' in Russian 23 Apr 80 p 1] 10,657

CORN GROWERS' OBLIGATION--Ordzhonikidze, 22 Apr (TASS)--Over 200 mechanized groups and sections in Northern Osetia have decided to obtain a 100-cent corn harvest this year. At present, the farmers have begun planting. The farms make use of industrial technology to raise this corn over an area of 45,000 hectares of fields. The machine operators have decided to complete the sowing work within 10-12 work days. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 23 Apr 80 p 1] 10,657

WORKING TWO SHIFTS--Semipalatinsk, 22 Apr (TASS)--The farmers of southern regions near the Irtysh River have driven their sowing machines out to the fields. High grade seeds are being planted in the well-prepared soil. The crop growers of this region are determined to maintain last year's achievements again. They have promised to sell the state at least 460,000 tons of grain. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 23 Apr 80 p 1] 10,657

AZERBAIJAN COTTON PLANTATIONS--Baku, 22 Apr (TASS)--Today, the farmers of Azerbaijan have completed the planting of cotton, almost a week earlier than last year. The seeds of this valuable technical crop were put in the soil over an area of about a quarter of million hectares. Thorough preparation of plantations, where proper planning, flushing of the ground to remove excessive mineral salts and water-loading irrigation aided in the faster pace of field work. Effective use was made of sowing machines, the mean output of each of which exceeded the standard by 10-15%. Seedlings have already turned green in some parts of the Kura-Araksinskaya Plain, where cotton was planted on the tightest schedule. The farms in the Muganskaya, Shirvanskaya and Mil'skaya steppes have also begun to work on the cotton fields. The cotton growers of Azerbaijan have taken on the obligation of exceeding this year the record achievements of last year, when more than 740,000 tons of raw cotton was delivered to the State. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 23 Apr 80 p 1] 14,657

CSO: 1824

LIVESTOCK

UDC 636.22/.28.084.522.053

EFFECTIVENESS OF RAISING CATTLE IN OPEN LOTS TESTED

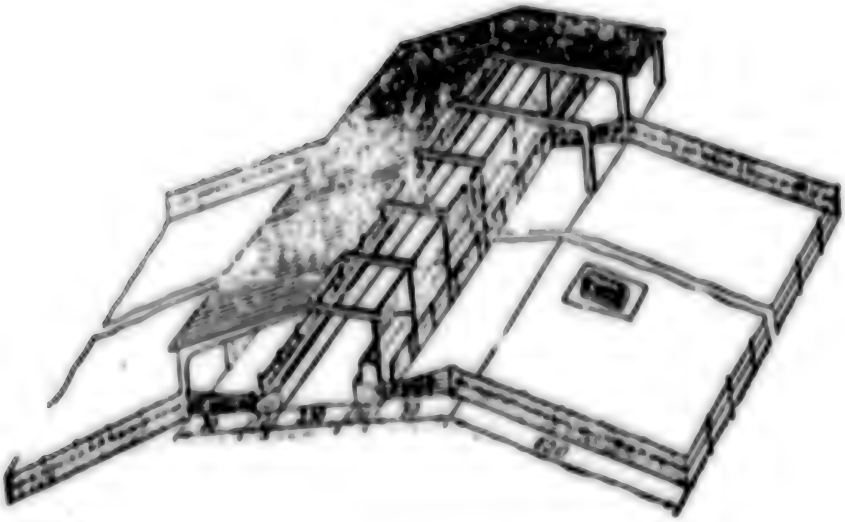
Moscow ZHIVOTNOVODSTVO in Russian No 2, Feb 80 pp 46-47

[Article by Academician VASKhNIL P. E. Ladan; V. N. Pristupa, chief of the beef cattle raising group, Donskoy Agricultural Institute; N. S. Zhukov, head of the "Bratskaya" feed lot; A. I. Likhovidov, senior research associate: The Effectiveness of Finishing and Fattening Young Cattle on Open Lots in Corrals of a Different Type]

[Text] Presently, an important place in the system of measures to intensify beef production is allocated to mechanized open feed pens such as the "Bratskaya," "Proletarskaya," and "Veselovskaya" (Rostovskaya Oblast), etc. Experience in their operation has shown that the economic efficiency of such a means of beef production depends in many ways on the influence of weather conditions. Analyzing the results of a 6-year operation at the "Bratskaya" Feedlot, it was established that on the whole, the average daily weight increase in live weight for the year varies from 827 to 1023 grams, while under unfavorable weather conditions in autumn, winter and spring, the average daily weight increase in live weight at the feedlot fluctuated between 200 and 800 g and feed costs per 1 kg of weight increase grew to 15-19 feed units. The production costs of one quintal of weight increase during the winter grew to almost R 190.

The "Bratskaya" Feedlot is situated in a zone of sharply continental climate with great daily from +6 to -27 °C) and yearly (from -30 to +38 °C) temperature fluctuations as well as strong easterly and southeasterly winds.

It is necessary to protect young livestock from the unfavorable effect of external factors (getting too cold, slush, wind, etc.) to obtain a stable, average daily weight increase during the winter-spring period. To this end, 3-meter-high windproof shields were installed in one corral along the sides, the band of solid covering near the feed trough was widened, and a covered feed trough was installed. The protective devices have the nature of a 3-walled shed with corrals on the western and eastern sides.



Supplemental Windbreak Enclosure

A comparative study of the development and growth of animals in the reoutfitted and the standard corrals at feedlots was made. During three evaluation periods (1976-1978) for this purpose, five groups were formed following the principle of analogs. There were 200 Red Steppe steers of age 9-10 months and a live weight of 195-215 kg in each group. The animals in group I were maintained in the reoutfitted corral, cattle of the same age in group II in another corral located opposite the reoutfitted corral. The animals in groups III and IV were maintained in corrals with a shed over the feeding passages, but were not outfitted with the protective devices. The cattle in group V were maintained in an open corral.

The steers in all of the groups were finished and fattened at an identical feeding level calculated to produce more than 1000 g of average daily weight increase. The feed mixture, which included barley, hay, silage, groats, molasses and micro-and macro-elements was given to the animals once a day with an additive and was totally consumed. It was established during the course of the experiments that the temperature and the air movement speed were not identical either at different points within a single corral as well in the various corrals.

The temperature was the same in the reoutiffed corral near the feed trough as in the old-style corrals, but the wind movement speed and the wind chill factor were less by a factor of 2-3 than in the remaining corrals. The animals in this corral were near the feed trough and near the wind screen where there was also low air movement speed and less of a wind chill factor.

The temperature was 1.7 °C higher in the corral on the western side under the covering of the reoutfitted corral than in the remaining corrals. The air movement speed equals zero and the air chilling capacity was 11-26 millicalories less than in the remaining corrals.

This regularity was also observed near the drinking troughs and in the center of the corral. The most favorable microclimate was noted in the corral of group II, where the temperature was 0.3-0.7 °C higher than in the remaining corrals and the air movement speed and the wind chill factor were less by a factor of 2-2.5. Moreover, during inclement weather in January 1978, when the air temperature inside the complex varied from +6 to -11 °C and the wind speed increased to 30 m/sec during a 7-hour period, the air temperature near the feed troughs in the corrals of groups I and II was -8.0 °C and the wind speed was 1.1 m/sec, whereas the temperature was -10 °C and the wind speed was greater by a factor of 11-12 in the corrals of groups III and IV. In the first two groups, all of the animals were under the shed near the closed feed troughs for days. The majority of the animals in group III were near the base of a mound which protected them from strong wind during these inclement days. The animals in groups IV and V congregated together in large groups and did not approach the feed troughs for days, with the aim of keeping themselves warm.

Upon studying the behavior of animals in winter and summer periods, it was revealed that for a large portion of the day, the steers in groups I and II were under the shed near the feed trough (33-60 percent) or on the solid covering near the screens (17.2-32.8 percent). Some age cattle from groups III and V were near the feed trough only 6-31 percent of the time whereas they laid or stood beyond mounds for 22-33 percent of the time daily. Moreover, in comparison with the former group, the latter animals utilized somewhat more time eating their feed during the cold time of the year but their eating activity was significantly lower (Table 1).

Table 1

Behavior of Experimental Animals

(in percent of time in a day)

1 Вид деятельности животных	2 Зима (−15−[illegible]°C)					2 [illegible]					3 [illegible]				
	I	II	III	IV	V	I	II	III	IV	V	I	II	III	IV	V
Едят 4	11,1	9,3	13,1	14,0	14,4	7,9	6,6	9,2	—	8,9	17,1	7,3	6,0	[illegible]	[illegible]
Пьют 5	0,2	0,3	0,1	0,3	0,2	0,1	0,3	0,3	—	0,7	0,4	0,2	[illegible]	0,1	[illegible]
Лежат в загоне 6	7,4	16,3	18,0	17,4	17,6	3,5	6,2	17,2	—	13,3	1,9	20,2	[illegible]	23,1	24,1
Стоят в загоне 7	10,3	8,5	10,0	9,7	10,0	6,6	8,7	7,9	—	10,3	11,4	18,4	[illegible]	17,2	11,6
Лежат под навесом 8	25,1	17,7	8,8	10,1	—	34,4	9,4	10,6	—	—	16,9	13,1	4,0	12,0	—
Стоят под навесом 9	34,4	22,0	7,8	7,7	—	22,9	20,3	10,6	—	—	11,2	7,5	9,6	9,4	—
Лежат у кургана 10	5,6	4,2	20,1	22,1	19,0	2,6	5,9	21,2	—	17,3	21,1	—	20,6	23,0	11,6
Стоят у кургана 11	6,4	3,1	17,6	13,6	22,1	3,3	4,7	15,6	—	10,4	7,6	—	3,9	6,6	6,9
Ходят 12	9,1	6,2	4,6	5,6	2,8	13,6	8,9	12,2	—	3,4	10,1	9,0	[illegible]	11,6	[illegible]
Стоят у щита 13	—	8,0	—	—	—	—	12,7	—	—	—	—	12,7	—	—	—
Лежат у щита 14	—	9,3	—	—	—	—	13,4	—	—	—	—	10,6	—	—	—
Стоят у кормушки 15	—	—	—	—	5,0	—	—	—	—	17,3	—	—	—	—	[illegible]
Лежат у кормушки 16	—	—	—	—	7,9	—	—	—	—	10,4	—	—	—	—	8,6

Key:

1. Animal Activity
2. Winter
3. Spring
4. Eating
5. Drinking
6. Lying in corral
7. Standing in corral
8. Lying under shed
9. Standing under shed
10. Lying near the mound
11. Standing near the mound
12. Walking
13. Standing near the screen
14. Lying near the screen
15. Standing near feed trough
16. Lying near feed trough

Table 2. Results of Finishing and Fattening Animals in Open and Semi-Open Corrals

Group	Liveweight of one animal at start of experiment, kg	Liveweight of one animal at end of experiment, kg	Gross weight gain, kg	Average daily weight gain kg	Feed unit expenditure per kilogram of weight increase		Production cost of one quintal of weight increase (R)
					For experimental period	Including in winter	
I	199.8	411.4	211.6	784	10.4	17.0	124.50
II	195.0	430.0	235.0	873	10.3	16.2	118.70
III	211.4	415.0	203.6	758	11.5	17.3	134.01
IV	213.6	410.1	196.5	728	11.8	19.36	134.64
V	208.8	394.2	185.4	687	12.2	21.4	137.40

The more favorable microclimate in corrals of groups I and II had a positive effect on the growth and development of the animals. The highest average daily weight increase was found in the animals from groups I and II. The steers from group II exceeded the animals from groups III, IV and V in weight gain by 118-185 g. Correspondingly, they had the lowest feed costs and production cost for weight increase (Table 2).

No reliable differences in meat productivity or meat quality were detected during the controlled slaughtering, however, the dressed yield was by 1.2-2.1 percent lower and bone and sinew content in the carcass 0.6-1.2 percent higher in the animals raised in the open corral (group V) than in the animals of the same age from the other groups. It is here necessary to note that 2-2.3 percent more fat than is the norm was detected in the carcasses of all of the animals, while greater protein content was detected in the longest back muscle (*musculus longissimus dorsi*) of the steers in group I, and increased moisture retention capability was established. This is obviously associated with the fact that energy-producing material is deposited less in the animal's tissues when there is less overcooling.

Thus, equipping feed lot corrals with supplemental "3-wall" protective devices promotes a reduction in overcooling of the animals in the winter, improves the microclimate of the corrals, increases the growth energy of the animals, and provides a supplemental profit per animal of up to R 50 on the average.

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LIVESTOCK

INTENSIVE FATTENING FOR IMPROVED BEEF PRODUCTION

Tashkent SEL'SKOYE KHOZYAYSTVO UZBEKISTANA in Russian No 2, Feb 80 pp 31-32

[Article by I. Khidirov and R. Khabibullin, candidates of agricultural sciences; M. Raimdzhanov, Candidate of Biological Sciences and B. Abilov, chief zootechnician at the Sovkhoz imeni Budennyy: "Intensive Fattening -- An Important Reserve for the Production of Beef"]

[Text] The decree handed down during the July (1978) Plenum of the CPSU Central Committee entitled "Further Development of Agriculture in the USSR" calls for meat production during the Eleventh Five-Year Plan to be increased to 19.5 million tons and the average delivery weight of young cattle stock -- increased to 400-500 kilograms.

In his speech delivered before the Plenum, L.I. Brezhnev stated "Specific work must be carried out immediately and a determination made as to where and how the cattle at each kolkhoz and sovkhoz are to be fattened in an intensive manner -- whether at specialized farms at sites on one's own establishment, or at interfarm enterprises.

The methods to be employed for further improving animal husbandry in Uzbekistan were defined during the 14th Plenum of the Central Committee of the Communist Party of Uzbekistan. It underscored the need for developing dairy and beef cattle husbandry and for the intensive maturing and fattening of cattle.

Beef production at the present time is being carried out mainly on the basis of dairy and mixed strains, which at the age of 15-20 days are being delivered to maturing and fattening complexes from dairy complexes.

The intensification of production operations at the maturing and fattening complexes is being achieved by means of improvements in the organization of labor and technology, by the complex mechanization of production processes, by the breeding of new and highly productive strains of cattle and improving existing strains and by the introduction of progressive methods for the maintenance and feeding of the animals.

With regard to the country's overall production of meat, beef constitutes 46-47 percent and in Uzbekistan -- more than 60 percent. This derives from the population's meat requirements and also from the specific nature of the existing feed base.

Full-value feeding plays a tremendous role in connection with increasing the production of beef and improving its quality. Full-value rations containing the required protein level and mineral and vitamin substances ensure not only a high growth energy for young stock but in addition they make it possible to reduce the feed expenditures required to achieve an increase in bulk. The meat of animals raised on full-value rations is richer in irreplaceable amino acids, which play an important role in human nutrition.

At the present time, the republic's animal husbandry program has still not been fully prepared for the production of goods using intensive methods. In this regard, improvements in the technology, particularly in the fattening of the cattle, constitute one of the more important problems at the present time. Our scientific-production experiments have shown that the technology for raising and fattening the animals is equally as important, for example, as the matter of selecting the proper strain.

The main reserve for increasing the production of beef, while simultaneously improving the quality of the meat, is that of intensifying the raising operations and expanding the scale of young stock fattening work, while recognizing that young stock constitute more than 70 percent of the animals being delivered for slaughtering. Great importance is also being attached to organizing the fattening of rogue cattle in all areas, to introducing industrial crossings involving the use of beef strains of bulls and to the accelerated development and intensification of specialized beef cattle husbandry.

Unused reserves for the production of beef are embodied in the correct organization of herd reproduction operations, in raising the yield of calves and improving their maintenance and also in implementing improvements in veterinary-zootechnical work.

The task of achieving accelerated growth in the production of beef throughout the republic and raising its efficiency must be solved both by intensifying the raising and fattening of young cattle stock and by building large animal husbandry complexes and modernizing and expanding existing farms. Moreover, importance is also being attached to making extensive use of facilities of a simplified type, combined with open sites for the fattening of the cattle.

During the past few years, extensive use has been made in many zones, including Uzbekistan, of the method of raising and fattening cattle at open sites. The advantage of such sites -- low construction expenditures and higher labor productivity, achieved through the use of simple and convenient technological programs for the maintenance of the cattle and machine systems.

The expenditures for material and monetary resources per animal at a site are 5-10 or more times lower than those at complexes of the closed type, where as a rule the cattle are maintained in large groups on a loose-housing basis. Depending upon the climatic and economic conditions found in individual zones and also upon the status of the feed base, several systems can be recommended for the raising and fattening of young cattle stock. In Uzbekistan, under conditions involving the use of an industrial technology, a preference is shown for year-round indoor maintenance. This derives from a shortage of pastures, from the requirements for more rational use of the land and also from the desire to standardize the feeding of cattle throughout the year and to avoid the differences in the summer and winter types of feeding.

In Uzbekistan, the raising and fattening of replacement young stock of beef and dairy strains and their crossings with beef strains, from an economic standpoint should ideally be carried out at open fattening sites year-round. During experiments which we conducted at the Krasnyy Vodopad Experimental Base, we studied the possibility of obtaining a high bulk yield from bulls of the black-speckled strain, raised under such conditions. Following their milking period, at 5 months of age, the bulls were transferred to open fattening sites for maturing purposes. The nutritional value of the ration during the maturing process amounted to 7.5 feed units, during final fattening -- 9.5, and the average for the entire period -- 8.2 feed units. With such a ration being used, each animal reached a live weight of 565.7 kilograms at 24 months of age. The maturing work was carried out up until the animals were 20 months of age and the final fattening with the animals in stanchions lasted for 4 months. The young stock were fed in exercise yards and the proportion of concentrated feed in the ration during the fattening and maturing period was 35 percent.

The average feed expenditures for the group, per kilogram of weight increase, amounted to 8.2 feed units, compared to the average figure for the republic of 15 feed units.

The controlled slaughtering of 24 month old bulls revealed that this type of system for raising the animals produced heavy carcasses containing only small internal deposits of fat. The slaughtering mass was 299.6 kilograms and the slaughtering yield -- 56.4 percent.

One important reserve for raising the meat productivity of cattle and improving the quality of the meat is that of industrial crossings of low productivity dairy cows and mixed strains with beef strains of bulls. The allotting of 25-30 percent of the cows for this purpose, without causing damage to the program for replacing the dairy herd at commodity dairy farms and complexes, is economically justified. Within the republic, such a contingent could amount to 350-400 head. Hybrid heifers, obtained as a result of crossings, should ideally be used for expanding the number of beef cattle by transferring them to specialized sovkhozes for replacing the brood stock. The remaining hybrid young stock must be assigned to industrial complexes and interfarm fattening enterprises for intensive raising for meat purposes.

The experiments revealed that when crossing red steppe cows with bulls of the Kazakh white head or Aberdeen Angus strains, the hybrids attain a live weight of 420-430 kilograms at 18 months of age and thus surpass pure-bred red steppe bulls by 10-12 percent in terms of this index. Their feed consumption per quintal of weight increase is 10 percent less.

At the 50 Let USSR Industrial Complex in Surkhandar'inskaya Oblast, when local cows were crossed with Aberdeen Angus bulls, the third generation young bulls attained a live weight of 457.6 kilograms at 18 months of age and thus surpassed in terms of live weight the first generation hybrids by 62 kilograms and the second generation -- by 29.7 kilograms. The third generation young bulls, while providing a higher increase in bulk, consumed less feed per kilogram of weight increase. As a result, the production cost per quintal of weight increase in these bulls was lower by 7.48 rubles than that for the second generation and 7.81 rubles lower than that for the triple-strain hybrids.

We recommend the following maintenance and feeding technology for the fattening of bulls at open sites. A PTU-10 fodder distributor should be loaded with alfalfa and corn fodder in the summer and with silage and haylage during the winter and it should be connected up to a Belarus' tractor. When moving along the feed passage, it places the feed in the trough in the following sequence: initially the succulent feed (silage and haylage) and subsequently cut straw.

One half of the daily norm for concentrates is issued with the aid of a KUT-3 fodder distributor together with the leftover unconsumed succulent feed and alfalfa hay.

The supplying of water represents an importanc condition for obtaining high weight increases and thus the year-round fattening sites must be equipped with automatic water bowls having electrical warming of the water during the winter. The water temperature is maintained within the limits of 16-18 degrees.

The fattening sites should be selected so as to have a slope of 7-9 degrees, thus making it possible to keep them in a dry state during the period of rainy autumn days. The dimensions of the sites are established depending upon the current and long-range fattening requirements. The plans call for hard surface sites to have 8-9 square meters of open space and 2-2.5 meters of space under a shed for each animal. Feed troughs must extend along the site to its middle portion and they must be separated by a passage 2.5 meters wide, along which the PTU-10 and KUT-3 feed distributors will pass. The passage, the feed troughs and the areas where the cattle stand are covered by a common lightweight shed.

An economic substantiation of the results of the experiment has shown that farms which have a strong feed base at their disposal must carry out the maturing and fattening of bulls of mixed dairy strains and their hybrids with bulls of beef strains to 24 months of age, raising their live weight to 550-600 kilograms.

The results of fattening operations carried out at open sites of the Krasnyy Vodopad Experimental Base turned out to be extremely promising. For example, the production cost for a quintal of weight increase at 18 months of age was 113.61 rubls and at 24 months of age -- 114.53 rubles. The profit realized from the sale of one head was 502.3 and 642.5 rubles respectively.

Success in the intensive fattening of cattle requires large scale production operations -- 5,000-10,000 head of young stock at each site. A requirement also exists for production specialization, division of labor and well organized contacts between the complexes and suburban farms -- the suppliers of the cattle.

An important element for intensified fattening operations is that of flow-line production, that is, the regular production of goods regardless of the season of the year, scientifically sound feeding of the cattle, proper organization of labor, efficient organization of the work of the zootechnical and veterinary services and the use of progressive methods and systems for controlling production.

Failure to observe just one of the above conditions will preclude the possibility of utilizing material and monetary resources effectively or of achieving a high return on capital investments for the construction and equipping of a fattening site or complex.

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INTENSIFICATION OF ANIMAL HUSBANDRY IN UZBEKISTAN REVIEWED

Tashkent SEL'SKOYE KHOZYAYSTVO UZBEKISTANA in Russian No 3, Mar 80 pp 23-28

[Article by Sh. Akmal'khanov, director of Uzbek Scientific Research Institute of Animal Husbandry and Corresponding Member of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin: "Animal Husbandry of Uzbekistan: Essence and Direction of Intensification"]

[Text] During the past 4 years of the Tenth Five-Year Plan, definite successes have been achieved in improving animal husbandry in Uzbekistan. Large-scale measures were carried out in connection with production specialization and concentration, the development of interfarm cooperation, the introduction of industrial methods for managing the branch and strengthening the feed base. As a result, the average annual production of meat, milk, eggs and other animal husbandry products increased substantially compared to the Ninth Five-Year Plan.

At the same time, many unsolved problems still remain in the work associated with the development of animal husbandry. These problems were thoroughly revealed during the 14th Plenum of the Central Committee of the Communist Party of Uzbekistan, which discussed the tasks of the party organization and all workers in the republic aimed at ensuring unswerving fulfillment of the decree handed down by the CPSU Central Committee and the USSR Council of Ministers entitled "Measures for Accelerating the Development of Animal Husbandry in the Uzbek SSR."

Long-term tasks for the republic's livestock breeders were defined during the Plenum: by 1980, the production of meat in live weight, at all categories of farms, must be raised to 740,000 tons, milk -- to 2.9 million tons and eggs -- to 2.68 million, or almost 1.5-2 times higher than the index for 1978.

This is why it is very important during this modern stage to uncover and employ specific methods for the intensification of animal husbandry in the future. For many years into the future, a determination must be made as to what must be done and how it must be done in order to implement the decisions handed down during the Plenum as rapidly as possible. Naturally, such a program of action can and must be based upon an entire complex of measures and upon the extensive use of the achievements of scientific-technical progress. It can definitely be stated that leading practice and the science of animal husbandry have already developed adequate recommendations for raising sharply the intensity and efficiency of all of the principal branches of animal husbandry, including feed production. These recommendations must now be introduced into operations on an extensive scale and utilized in an intelligent manner and the role played by science in production must be intensified. Of interest are studies carried out by union scientific institutes and also the recommendations made by republic research organizations, particularly the Uzbek Scientific Research Institute of Animal Husbandry.

Let us examine the principal and more rational trends in the development of the republic's animal husbandry for the future.

One of the principal factors affecting the efficiency level of dairy cattle husbandry is the quality of the animals, which is determined to a considerable degree by the level of the breeding work carried out. Changes for the better are obvious here -- this year the proportion of pedigree cattle on the republic's farms has been raised to 95 percent. The work carried out by 8 breeding plants and 43 breeding farms in the republic has played a definite role in this regard. The workers at the Institute of Animal Husbandry also made a contribution. They are carrying out studies with great effect at 12 of this year's breeding farms and, as a result, a considerable number of 1st class heifers and bulls are sold annually, the breeding of which promotes improvements in the productivity of the kolkhoz and sovkhoz herd.

Fine prerequisites have been created for increasing the number of highly productive cattle. For example, the republic breeding enterprise has been supplied with highly valuable bulls of dairy and dairy-meat strains. Two highly productive lines of the black-speckled cattle and more than 30 families having a productivity of 5,000-10,000 kilograms annually and a milk fat content of 3.7-3.8 percent have already been bred. Three lines and 15 families of shvitskiy cattle and four lines and 20 families of the bushuyevskiy strain are available; all of these hold great promise with regard to improving the herd in terms of milk yields and milk fat content.

In order to further improve breeding work in dairy cattle husbandry, it will also be necessary to organize 37 more breeding farms by 1985, including 15 for the black-speckled strain which possesses a higher potential for milk productivity. The proportion of black-speckled cows among all of the pedigree cows must be increased, with the specific conditions being taken into account.

A strong reserve is that of employing modern breeding methods. On the basis of such methods alone and by means of genetic improvements in the herd, it is possible to raise the milk yields by 50-60 kilograms annually. Thus, it will be possible by 1985 to raise the average milk yield for a forage cow, for the republic as a whole, to 2,725 kilograms and by 1990 -- to 3,012 kilograms.

The intensive and intelligent use of improvement-bulls for all of the planned strains represents an important measure for improving the genetic potential. Thus, prior to the end of the Eleventh Five-Year Plan, a check must be carried out on the quality of the offspring of 90 bulls of Uzgosplempredpriyatiye [Uzbek State Breeding Enterprise] and no less than 35 percent of the republic's brood stock must be inseminated using the semen of improvement-bulls.

The raising of bulls obtained from the best champion cows and improvement bulls of promising lines must also be carried out with these same goals in mind. This imposes a requirement on the breeding farms to select the best cows. In addition, a specialized farm for the raising of these animals and for checking upon the productivity and quality of their offspring must be organized and attached to Uzgosplempredpriyatiye.

With regard to improving the strains of cattle, importance is also attached to utilizing the international genetic resources, particularly Holstein-Friesian bulls and American Swiss.

For the purpose of coordinating breeding work throughout the republic, a scientific-production association should be created at the Institute of Animal Husbandry and also a support base for the institute at Samarkand.

As is known, one of the priority tasks established during the 14th Plenum of the Central Committee of the Communist Party of Uzbekistan is that of increasing the production of meat.

Here the chief reserve consists of intensifying the raising operations and expanding the scale of fattening work carried out with young stock, which constitute more than 60 percent of the animals being slaughtered. Moreover, more than 95 percent of the beef is being obtained from cattle of dairy and dairy-meat strains. Thus importance is being attached to achieving a high meat productivity not only through the use of leading equipment for raising and fattening work, but also by employing diverse genetic strains. The international genetic resources for cattle strains are of primary interest. The more successful combinations of these strains with animals of dairy and dairy-meat strains have been defined by the scientists. This powerful biological method makes it possible to raise the meat productivity of cattle by 15-20 percent and it must be employed extensively on all of the commodity farms of kolkhozes and sovkhozes.

Studies carried out by workers at the Institute of Animal Husbandry have shown that the industrial crossing of low productivity dairy strains of cows with bulls of the Charolais strain. Such hybrid animals achieve a live weight of 500-510 kilograms at 15 months of age. The combining of the Aberdeen Angus and Red Steppe strains, the hybrids of which reach a weight of 430-450 kilograms at 15 months of age, warrants more widespread use.

Notwithstanding an overall and good increase in the number of cattle throughout the republic, the number representing specialized meat strains is still quite low -- only 5.2 percent of the overall number of cattle. Meanwhile, growth in this index constitutes one of the principal reserves for increasing the production of beef. Thus the proportion of beef cattle on farms throughout the republic must be raised to 15 percent in the near future.

The basis for the development of beef cattle husbandry is the expanded reproduction of beef cattle strains -- Saint Gertrude, Aberdeen Angus and Kazakh White Head strains and their hybrids -- with planned strains, in the republic's piedmont and mountainous zones and along the lower reaches of the Amu-Dar'ya River.

The allotting of up to 25-30 percent of the republic's cows for industrial crossings with meat strains is economically justified with no damage being inflicted on herd replacement operations at commodity dairy farms and complexes (excluding breeding farms). The hybrid heifers obtained as a result of such operations should ideally be used for building up the herds of beef sovkhozes, with the remaining young stock being scheduled for raising and fattening on an industrial basis.

Each year, 15-20 percent of the cows culled out from the republic's overall herd, or 70,000-80,000 head, are sent to meat combines. They are turned over without preliminary fattening and this leads to great losses in the production of beef. By means of fattening, their live weight could be increased by 60-70 kilograms and the increase for all of the animals would amount to 40,000-45,000 quintals of live weight.

The experience accumulated in the intensive fattening of young stock for a longer period of time is deserving of attention. This makes it possible to obtain heavy young stock having a live weight of 650-700 kilograms.

When making plans for fattening farms, the favorable climatic conditions of Uzbekistan should be taken into account and a preference should be shown for open fattening sites. For example, the cost for one cattle billet at the latter is 120-150 rubles and at closed facilities of complexes -- 5-6 times higher.

At the present time, high quality new methods for achieving genetic improvements in the strains have been developed by the scientists. The creation of synthetic genotypes possessing a complex of desirable characteristics is becoming more and more realistic. The complete realization of the genetic potential of such animals must be promoted by the accelerated raising of cattle based upon full-value nutrition. This represents a tremendous reserve for the immediate future. Theoretical developments and practical methods are already available at the present time for raising the average daily weight increases of the young stock to 1,300-1,400 grams, with an expenditure of 5.5-6 feed units per kilogram of weight increase. Thus, studies along this line should be accelerated and the results of such studies introduced into animal husbandry practice.

Serious measures have been undertaken recently throughout the republic in connection with developing pig farming on an industrial basis -- a branch which makes it possible to intensify meat production at a rapid rate. Two large complexes -- Gallyakuduk and Sergeli -- were placed in operation during the Tenth Five-Year Plan and construction is being completed on similar farms in Ferganskaya and Dzhizakskaya oblasts.

The plans call for the construction of five more breeding plants and 12 pig farming complexes, with the plans calling for 11 of the latter, representing an overall capability for handling 594,000 head, to be placed in operation in 1985.

By the end of the Eleventh Five-Year Plan, the number of pigs will have been increased by twofold compared to the figure for 1979, an increase of 193 percent, and pork production will increase by 223 percent.

By 1985, the proportion of pork with regard to overall meat production in Uzbekistan will reach 15.3 percent. The development of this branch will be carried out in conformity with the system developed by UzNIIZh [Uzbek Scientific Research Institute of Animal Husbandry] for breeding and the organization of breeding work in pig farming and with the complex plan for selection-breeding work in the republic during the 1980-1990 period. In accordance with the new system and taking into account the construction of new complexes, the breeding base will consist of five state breeding plants and seventeen breeding farms and controlled fattening stations for testing bulls in terms of the quality of their offspring.

In the interest of ensuring the successful development of pig farming throughout the republic, a hybrid center having an earlier planned controlled fattening station should be built at the Complex imeni Il'ich in Samarkandskaya Oblast or at the Gallyakuduk Complex in Tashkentskaya Oblast. A check should be carried out here on the combining of selected paternal lines of pigs planned for Uzbekistan with new and highly productive lines of pigs bred by breeders throughout the country. As more effective combinations of lines and strains become available, they will be used to replace the strains in the original plan for triple-strain crossings at all complexes throughout the republic.

The introduction into operations of mixed feed recipes made from local feeds and developed in our institute should be accelerated. They can be used in all areas for different mature groups of pigs -- at state breeding plants, breeding farms and complexes.

When processed mixed feeds are used during fattening operations, the average daily weight increases range from 600 to 700 grams. The length of time required for achieving 100 kilograms of live bulk during fattening must not exceed 195-200 days.

Young pigs raised on mixed feed prepared on the basis of an UzNIIZh recipe attain a live weight of 39 kilograms by the time they are 106 days old.

The introduction of non-milk mixed feeds for young pigs at the Tashkentskiy Sovkhoz and at a number of other farms produced a savings of 6 liters of whole and 20 liters of skim milk per head.

The use of processed mixed feeds for young pigs throughout the republic as a whole will make it possible to realize a savings of 1,400 tons of whole and 4,800 tons of skim milk annually.

The introduction of mixed feeds prepared on the basis of an UzNIIZh recipe at the Politotdel, imeni Sverdlov and imeni Kim Pen Khva kolkhozes and at the Sergeli Complex produced some interesting results. It ensured average daily weight increases here during fattening of 570-700 grams, with an expenditure of 4-5 feed units per kilogram of weight increase.

The Ministry of Procurements for the Uzbek SSR must accelerate the production of mixed feeds prepared on the basis of recipes developed at the institute. Their extensive use at all complexes will ensure those productivity parameters embodied in the technology employed by such farms and furnish the consumer with high quality non-greasy pork.

The existing plan for the breeding of karakul, meat-fat and meat-wool sheep will be retained in the future throughout the republic.

The plans call for the number of sheep to be raised to 9 million head prior to the end of 1990.

An entire complex of measures must be carried out in order to raise the level of concentration and intra-branch specialization in sheep raising, increase cooperation in labor and develop collective forms for organizing labor. First and foremost is the need for building sheep raising complexes for meat-wool strains of sheep. A requirement exists for creating an industrial complex for Gissar sheep, for 5,000 ewes in order to retain sheep of the desired type, and also a fattening site for 10,000 head at the Baysun Sovkhoz in Surkhandar'inskaya Oblast.

In the republic's sheep raising regions, the plans ideally call for the construction of fattening sites belonging to the Glavzagotzhivprom system of the Ministry of Agriculture for the Uzbek SSR, for 5,000-10,000 or even 15,000 head.

One of the chief reserves for raising the effectiveness of sheep raising is that of flooding and irrigating vast areas deemed suitable for the maintenance of sheep. The creation of cultivated pastures on these areas and the development of field feed production operations will enable the kolkhozes and sovkhozes to increase sharply their numbers of sheep.

Scientific studies and leading practice have proven that the early lambing of sheep represents a progressive method for managing the branch. It should be introduced into operations at all farms on a more extensive scale. In addition, serious attention must be focused on the structure of the herd. In the zone of meat-wool sheep raising, the proportion of ewes must be raised to 60 percent and in the zone of meat-fat sheep raising -- to 70 percent. Once this is achieved, it will be possible to obtain wool and meat at the lowest production cost and also to ensure a high level of production profitability.

In order to raise production efficiency at large-scale mechanized sheep raising farms, winter and early spring lambing, with the introduction of cyclical insemination and group lambing of ewes, must be organized. The replacement young stock obtained here should be turned over for meat purposes only following grazing and fattening and when they have attained a live mass of 40-55 kilograms. Fenced-in cultivated pastures must be created in the vicinity of the sheep raising complexes and on the summer ranges.

With regard to the fattening sites, they should be organized in a manner such that the fattening work can be carried out on an industrial basis and further branch specialization and intensification will be promoted on the whole.

As is known, specialized poultry raising farms are presently still unable to solve fully the problem of supplying the population with poultry products. Thus poultry raising must be further developed at the kolkhozes and sovkhozes. Here the farms can be relatively small -- up to 5,000 head -- but they must have a high level of mechanization, a leading technology and highly productive hybrid poultry.

At the present time, the selected poultry lines and populations have achieved such a level of productivity that further progress is becoming impossible using only the generally accepted breeding methods. Hence, one of the main tasks of the scientist-breeders is that of developing new and more effective methods for achieving a genetic effect with poultry and selection methods.

The task of science consists of developing its own optimum technology for managing the branch, for each category of poultry raising farm (poultry factories, kolkhozes and sovkhozes and subsidiary farms).

During the summer period, when many production buildings (breeding houses and others) are not being used, the possibility exists of re-equipping them for the raising of chicks for meat purposes.

An important problem is that of mechanising the laborious processes being carried out at commodity dairy farms and complexes. As a result of studies conducted by workers at UzNIIZh, an optimum system of machines and mechanisms has been established and recommended for the modern period.

The studies revealed that at farms having up to 200 cows and also at farms with milk yields up to 2,800 kilograms, with any number of animals, use should ideally be made of AD-100A milking units, equipped with Volga devices. The remaining farms should have UDT-6 type tandems for the principal herd.

During the 14th Plenum of the Central Committee of the Communist Party of Uzbekistan, a degree of urgency was attached to the task of creating a strong feed base for animal husbandry. Truly, this problem is today becoming of decisive importance. It is impossible to achieve long-range goals in the development of all branches of animal husbandry in the absence of improvements being carried out in feed production, or attaching a specialized branch character to it.

Under Uzbekistan conditions, where forage crops are cultivated in conjunction with a system of cotton-alfalfa crop rotation plans, which occupy 25-30 percent of the areas, growth in the feed base is achieved through the intensive use of land.

The intensification of feed production for the future must be based upon the following: extensive introduction on forage field areas of intermediate crops, with a subsequent sowing of corn and sorghum for grain and silage; winter sowings of grain crops for grain purposes, with subsequent use of the land for raising corn for silage; combining of silage corn with fodder beets and Sudan grass with alfalfa. In other words, those measures which make it possible throughout the year to obtain 15,000-20,000 feed units from a hectare of irrigated arable land, used for cotton-alfalfa and forage crop rotation plans.

In order to increase the productivity of forage crops, greater attention must be given to the introduction of intensive varieties of forage crops, which respond well to fertilizers and irrigation: Tashkentskaya-1 and Tashkentskaya-3192 alfalfas, Uzbekskaya-100 and Uzbekskaya Zubovidnaya varieties of silage corn, Uzbekskaya Polusakharnaya fodder beets, sorghum for silage -- Chilyaki local improved, sorghum for grain -- Karlik Uzbekistana, oats for green feed -- Shirokolistnyy and Tashkentskiy-1 varieties, barley -- Uzbekskiy Irrigated and a number of other varieties of forage crops.

On the basis of agrotechnical cartograms, special importance is being attached to the introduction of optimum mineral fertilizer norms for each forage crop. For the purpose of ensuring the correct use of highly productive varieties, a requirement exists for working out those problems associated with the programming of high yields of feed, against a background of high dosages of mineral fertilizers.

An important feed reserve is that of making more complete use of the waste products of the meat and dairy, silk-winding, food and cotton ginning industries, as well as sheep raising and the grain economy (straw, chaff and so forth). Toward this end, the Uzgiprosel'stroy Institute should accelerate the planning for specialized feed preparation shops, which operate on the basis of the technology proposed by UzNIIZh, and thereafter it should organize the construction of such feed preparation shops on the farms.

In addition to those measures aimed at intensifying field fodder production, every effort must be made to introduce a new and progressive method for the summer maintenance and feeding of cattle on cultivated and irrigated pastures. Towards this end, pasture tracts must be created at the large farms and complexes, such that dry cows and cows following calving can be pastured up until fruitful insemination and on the remaining farms -- such that all of the animals can be pastured throughout the summer season.

Based upon many years of experience accumulated at UzNIIZh, a recommendation can be made to introduce for use in Uzbekistan both short-term and long-term cultivated pastures, having grass stands which are complex and yet balanced in terms of the principal nutritional components. On irrigated tracts, they could include from among the pulse crops -- alfalfa, and from among the grasses -- English bluegrass, pasture ryegrass, cock's-foot and Sudan grass.

In order to strengthen the feed base for beef cattle husbandry and sheep raising (excluding the raising of karakul lambs), extensive measures must be carried out aimed at raising the productivity of natural pastures in non-irrigated and partially irrigated zones and in the mountainous zone. This can be accomplished by means of surface applications of mineral fertilizers and by sowing summer cypress and other forage plants. Forage crops should ideally be sown in the non-irrigated zone: alfalfa, rape, sunflowers and others.

In order to achieve success in the intensification of feed production in all zones throughout the republic, farms specializing in the production of seed should be organized to the point where the kolkhoz and sovkhoz requirements for forage crop seed are completely satisfied.

An acceleration in the creation of cultivated pasture tracts and the conversion over to the pasture maintenance of cattle require a seed fund for both newly established tracts and for the systematic repair of tracts that have already been employed. The organization of seed farms throughout the republic will make it possible to accomplish this.

For the purpose of successfully establishing and using cultivated pastures in Uzbekistan, the course entitled "Grazing Farming" should be introduced for use by the agrotechnical and zootechnical faculties of the republic's agricultural VUZ's.

Numerous studies have established the fact that the feeding of low quality feed to animals results in an over-expenditure of such feed of up to 30 percent. In the structure of production costs for animal husbandry, feed expenditures account for 60-67 percent.

Thus, decisive measures must be undertaken to protect the quality of the feed produced and to ensure the use of a progressive technology for the preparation and feeding of such feed.

Towards this end, one of the mixed feed plants should specialize, during the next few years, in the production of ZTsM [zamenitel' tsel'nogo moloka; whole milk substitute] for calves and young pigs.

The use of whole milk substitutes is a very urgent problem and one which has not yet been resolved in Uzbekistan. In view of this fact, a milk substitute consisting mainly of local feeds has been developed by the Institute of Animal Husbandry. The raising of calves on a reduced (50 percent) whole milk norm, using a recommended ZTsM, ensures normal growth and development for the calves. At the same time, the average savings in whole milk for each calf is 175 kilograms, which is equivalent to 34 rubles of profit.

The use of a ZTsM alone, at one industrial complex for the maturing and fattening of young cattle stock having a capability for handling 10,000 head, will make it possible to realize a savings of 1,750 tons of whole milk and realize a profit of approximately 500,000 rubles.

Specialized plant-sovkhozes for the production of full-ration granules and briquettes, based upon maximum use of the waste products of crop husbandry, should be organized in each oblast of the republic. At the present time, they can be easily equipped with highly productive domestically produced units.

More extensive use should be made of the method of chemical preservation of green alfalfa, corn and other grasses, using organic (formic and benzoic) acids, which ensures the preservation of the feed up to 97-98 percent.

All oil extraction plants should have industrial departments for the production of briquetted (pressed) cotton bolls, with small amounts of lipids being added. Their advantages and importance have been demonstrated in the form of experience accumulated at the existing experimental-industrial department at the Uchkurgan Oil Extraction Plant, where its daily productivity is 45-50 tons of briquettes.

One unsolved problem is that of balanced animal rations in terms of full-value protein. The protein deficit in some branches of animal husbandry is 10-20 percent and this tends to raise feed expenditures for the production of goods to 20-30 percent.

Several methods are available for overcoming the protein deficit.

One such method is that of increasing the capabilities of the Yangiyul' plant for the production of nutrient hydrolized yeasts. The yeasts will contain up to 50 percent crude protein and a high amount of irreplaceable (for the animal organism) amino acids. The introduction into the rations of 3-5 percent hydrolized yeasts raises their biological full value and the productivity of the animals by 8-12 percent.

A large reserve raw material for yeasts in our republic is that of cotton stalks. Its use is being held back by an absence of special mechanisms for the procurement, delivery and milling of the stalks.

Jointly with workers in the oil and fat industry of the republic, workers at the Institute of Animal Husbandry have developed and mastered a new technology for obtaining oil seed meal. It contains 1[illegible] percent more crude protein than the usual type and two times less cellulose. The boll content in the oil seed meal is reduced by 3.5 times.

An experimental check carried out on this particular oil seed meal reveals that a need exists for the construction, during the next few years, of 1-2 suitable plants for meeting the requirements of the mixed feed industry and also for satisfying the animal husbandry needs of kolkhozes and sovkhozes. The placing in operation of the Gulistan Oil Extraction Plant, which will produce high protein petal oil seed meal, must be accelerated. These measures will tolerate no delay, particularly in view of the fact that since 1977 the republic's oil extraction plants have been producing oil seed meal in accordance with the new State Standard 606-75, which tolerates a raised percentage of bolls in the oil seed meal.

One of the questions associated with solving the problem of providing protein for the republic's animal husbandry program is that of introducing technologies at the oil extraction plants that will make it possible to raise the quality of its most important component -- protein. The technological plans required for this have already been developed by the scientists. In particular, the method of dual extraction of fat, developed by workers at the Institute of Chemistry of the Academy of Sciences for the Uzbek SSR, has still not been introduced into operations. A test carried out on experimental batches of an oil seed meal produced under semi-production conditions at the Institute of Chemistry revealed a higher productivity in poultry than that obtained when the standard oil seed meal was used. The increasing requirement of industria animal husbandry for high quality protein dictates an urgent need for the construction in our republic of plants which employ this technology.

Science and practical experience have established the fact that in Uzbekistan the rations given to agricultural animals (especially cattle) are marked by a serious shortage of phosphorus.

As a rule, when there is a 15-20 percent surplus of calcium in the rations for cows, compared to the accepted norms, there will be a 20-30 percent deficit of phosphorus. A similar situation prevails in the rations for young cattle stock during the post-milking period. As a result, diseases occur more frequently among the animals: rickets, osteomalacy, mass passing of ruts without pregnancies and sterility, delivery of weak and dead calves, lambs, young goats and so forth. In addition, the biological value of milk and meat as nutritional products for man is lowered.

The question concerning the industrial production in the republic of a mineral dressing for the agricultural animals has been raised repeatedly and yet it still remains unsolved.

Meanwhile, the fertilizer produced in Uzbekistan -- ammophos -- is a rich source of nitrogen and phosphorus. In the interest of animal husbandry, a portion of these products should be rendered harmless (defluorinated), while retaining its phosphorus content.

In addition, industrial departments must be created for the production of mineral dressings for agricultural animals that are based upon the use of defluorinated ammophos and the production of feed limestone for animals and poultry should be organized at the Almalyk deposit.

This then is the principal thrust and direction to be pursued in connection with the intensification of animal husbandry throughout the republic during the next few years. They derive from the most recent scientific achievements and from a summary of leading experience accumulated over a period of many years.

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ACCELERATED DEVELOPMENT OF ANIMAL HUSBANDRY IN UZBEK SSR

Moscow SEL'SKAYA ZHIZN' in Russian 15 Mar 80 p 2

[Article by A. Uzilevskiy (Uzbek SSR): "For Animal Husbandry -- Accelerated Development"]

[Text] During the past 10 years, the production of meat at kolkhozes and sovkhozes in Uzbekistan increased by 1.7 times, milk -- by 2.1 times and eggs -- by threefold. The milk yields of cows doubled, the average delivery weight of cattle was raised by more than one third and the number of animals increased considerably. The state tasks for the development of this important branch are being carried out ahead of schedule. Tashkentskaya Oblast is firmly holding onto first place in the competition to improve animal husbandry. During the past year, the oblast's kolkhozes and sovkhozes increased their production of meat, milk and eggs, the milk yields of the cows were raised to 3,320 kilograms and the average delivery weight for cattle -- to 410 kilograms. The farms are obtaining high forage crop yields and they have created a fine supply of forage for the indoor maintenance period. During the final year of the five-year plan, the oblast's livestock breeders have resolved to increase their production of meat by 25 percent above the figure for 1979, milk -- by 20 and eggs -- by 27 percent.

Leonid Il'ich Brezhnev has valued highly the successes achieved by the Tashkent livestock breeders. The results achieved by the Tashkentskaya Oblast workers and the high socialist obligations which they have undertaken for 1980, it is stated in his salutatory telegram, underscore the tremendous reserves that are available in the cotton growing regions of the country, for use in the development of livestock husbandry.

How best to utilize these reserves, achieve a further increase in the production of animal husbandry products and at the same time increases in cotton, grain, vegetables and orchard products, what tasks should be solved by the party organization -- such were some of the questions which the regular Plenum of the Central Committee of the Communi[illegible] of Uzbekistan focused its attention on. During the Plenum, a speech was delivered by Candidate Member of the Politburo of the CPSU Central Committee and First Secretary of the Central Committee of the Communist Party of Uzbekistan, Sh. R. Rashidov.

The problem concerned with the accelerated development of animal husbandry in the republic is of great importance with regard to ensuring more complete satisfaction of the requirements for farm products, through the production of such goods on the spot. The measures aimed at achieving accelerated development of animal husbandry in Uzbekistan call for an increase in meat production at all categories of farms to 740,000 tons, or 48 percent more than the results for 1978, milk -- to 2.9 million tons (45 percent more) and eggs -- to 2.68 million -- two times more than the level already achieved.

The methods for carrying out the planned program were discussed in the speeches delivered by the first secretaries of the oblast party committees M. Musakhanov, K. Kamalov, A. Karimov, R. Gaipov and B. Rakhimov, the operator of the Krasnyy Vodopad machine milking farm and Hero of Socialist Labor A. Chudnaya, the director of the Rassvet Sovkhoz T. Suleymanov and by others.

During last year alone, a number of oblasts and many rayons throughout the republic succeeded in increasing their production of meat, milk and eggs by 15-20 percent. Hundreds of Uzbekistan kolkhozes and sovkhozes are achieving increased production by raising the productivity of the animals. The chairman of the Akaltyn Kolkhoz in Tashlakskiy Rayon in Ferganskaya Oblast, T. Igamberdyyev, cited the following indices in his speech: the annual milk yield for a cow on the farm exceeds 4,200 kilograms and the delivery weight for cattle -- 580 kilograms and for sheep -- 80 kilograms.

All of the republic's farms and rayons have large reserves at their disposal. But these have not been placed in operation in all areas. The leaders of agricultural organs in a number of rayons in the Karakalpak ASSR and in Samarkandskaya and Khorezmskaya oblasts were criticized during the Plenum for not having fulfilled their obligations for producing and selling meat to the state last year. The productivity of dairy herds on farms in Surkhan-Dar'inskaya and Bukharskaya oblasts continues to remain low. Although correct measures were developed here, their practical implementation was not reinforced by good organizational work.

Last year, the milk yields for cows increased an average of 125 kilograms throughout the republic and reached 2,361 kilograms. The average delivery weight for cattle was 375 kilograms.

For this year the Plenum has established the task of raising the milk productivity of cows to 2,500-2,600 kilograms for the republic as a whole and in the dairy zone, in specialized regions and farms -- to 3,500-4,000 kilograms. The decision has been made to raise the delivery weight of cattle to 400-410 kilograms and next year -- to 450 kilograms. Those participating in the plenum placed emphasis on the fact that the implementation of the planned program for developing animal husbandry requires improvements in reproduction of the herd. In a number of areas, there is a great amount of barrenness among the cows. In Koshkupyrskiy Rayon, for example, less than 70 calves are being obtained from every 100 cows. Similar situations prevail in Gulistanskiy, Zaaminskiy, Sverdlovskiy and certain other rayons. Improvements must be carried out in the raising of young stock for replacement purposes at complexes and farms, with specialized farms being created for this purpose. The experience accumulated in this regard in Tashkentskaya and Samarkandskaya oblasts is deserving of broad dissemination.

It was stated during the Plenum that meat production can be increased through the development of rabbit and horse breeding, by organizing the work of consumer cooperation fattening farms in a more efficient manner and also the subsidiary farms of industrial enterprises and by increasing the number of productive livestock and poultry being maintained on the private plots of the population. The farms of consumer cooperation and the subsidiary farms of enterprises are already supplying tens of thousands of tons of meat for the population. The owners of domestic livestock are selling their surplus animal husbandry products to procurement organizations. During the past year, the number of cattle in this sector increased by 112,000 head and sheep and goats -- by 187,000 head.

Those who participated in the Plenum devoted special attention to those questions concerned with strengthening the feed base, increasing the production of protein and creating strong forage funds. This year the production of grain in the republic must be increased to 3.15 million tons, mainly through the growing of corn. Protein rich soybeans are included in the forage crop group.

Uzbekistan is the country's principal cotton growing base. Such subjects as further intensifying the gross yield of raw cotton and raising the efficiency of cotton production were quite properly reflected in the reports and speeches delivered by those participating in the Plenum. The attention of all of the communists and the leaders of the party, soviet and agricultural organs was concentrated on the reserves of the leading branch and on further increasing the production of cotton. During this current year, a greater amount of cotton must be sold to the state from the fields of Uzbekistan than was sold during the record year of 1979. This task must be solved mainly by raising the cropping power of the fields. An average of 32 quintals of raw cotton must be obtained from each hectare. Concern for animal husbandry and cotton production, it was emphasized during the Plenum, must be combined with constant attention being given to the other branches of agriculture and to fulfilling the state plans and obligations for the production and sale of all of the field and farm products. The party organization of Uzbekistan is subordinating its activities towards the implementation of this important task.

The Plenum adopted a decree on the subject discussed.

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REGIONAL DEVELOPMENT

USA-USSR AGRICULTURAL PRODUCTION COMPARED

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 3, Mar 80 pp 51-53

[Article by N. Koditsa, candidate of economic sciences: "Agriculture in the USSR and Questions of Worldwide Grain Production"]

[Text] Our country is now in its seventh decade of socialism. In historical terms this is not a long period. But if we consider that about 20 years of this time were devoted to war and the post-war restoration of the national economy, then the USSR has made a great jump in its development. The USSR has become a great power, making a great contribution to world civilization and playing an important role in solving the most important international problems.

The experience of socialist and communist building in our country and especially of the transformations in agriculture and its transition to an industrial base is being utilized widely by the countries of socialist cooperation. It is attracting the attention of the countries of the world that have been released from the bondage of colonialism. Nevertheless, our enemies are striving to diminish the advantages of socialist agricultural production in every way possible, to prove the superiority of the capitalist csystem, which is based on private ownership of the means of production. In developing the agrarian policies of our party, V. I. Lenin in his works showed the unsoundness, destruction and proletarianization of small peasant farms under capitalist conditions.

At the present time agriculture in our country is a system of large socialist agricultural enterprises--kolkhozes, sovkhozes, agroindustrial and interenterprise forms and other integrated enterprises. At the end of 1978 the country had a total of about 27,000 kolkhozes, 20,500 sovkhozes, 9,000 interfarm enterprises, organizations and associations working on an industrial base and a large number of scientific-research institutions. According to the data for 1978 the collective farm, or kolkhoz, in our country consists of 6,700 hectares of agricultural lands, including 3,800 hectares of plowland, 1,788 head of cattle, 1,078 hogs and 1,832 sheep and goats. Fixed production capital for agricultural purposes according to balance costs comprised an average of 3,111,000 rubles per one kolkhoz; and indivisible funds in fixed and working capital--3,948,000 rubles. The sovkhoz is an even larger socialist enterprise. It has a large quantity of land, is technicallly well supplied and has a higher level of production intensification. In 1978 on the average each sovkhoz had 17,600 hectares of agricultural lands, including 5,500 hectares of plowland, 1,905 head of cattle, 1,112 hogs and 3,318 sheep and goats. The total cost of fixed production capital for agricultural purposes comprised 4.7 million rubles on the average for each sovkhoz.

Kolkhozes and sovkhozes actively participate in interenterprise and agro-industrial cooperation. They quickly solve socio-economic problems in villages that concern the well-being of workers.

The USSR is the greatest power in the world in the volume and variety of agricultural production. We have a huge land area which, in the words of V. I. Lenin, is the most important agricultural means of production. In late 1978 the area used by agricultural enterprises and farms comprised about 553 million hectares, including 226.2 million hectares of plowland, 35.7 million of haylands and 285.4 million of pastures. As of 1 January 1980 the herd of cattle was 115 million head, including 43.3 million cows. There were 83.7 million hogs and 149.2 million sheep and goats. This is more than in early 1979.

At the present time gross agricultural production exceeds the pre-revolutionary level by 4.4 times. During 4 years of the 10th Five-Year Plan average annual grain yield was 209 million tons, or 27.4 million tons more than the average annual production during 1971-1975. In 1979 90.1 million tons of wheat, 8.1 million tons of rye, 8.4 million tons of corn grain and 2.4 million tons of rice were produced. The largest cotton harvest--over 9 million tons--was produced. The state plan for the sale of cotton was fulfilled by all cotton-growing republics (Uzbek SSR, Turkmen SSR and Tadzhik SSR).

In 1979 the gross yield of potatoes was overfulfilled. Four million tons more than in the preceding year were produced. The potato farmers of the Ukraine and Belorussia worked successfully.

Workers of the villages of Azerbaijan and Moldavia achieved good results and Armenia and Georgia fulfilled their plans for sales to the state of the main agricultural products.

This is the result of the practical realization of the decisions of the July 1978 Plenum of the CPSU Central Committee, which developed a program for the continued growth of agriculture in the country over the long-term. The growth in the productivity of farming and livestock raising is the result of the firm and consistent party course directed at the overall intensification of production and of the successful implementation of the modern scientifically-based agrarian policies of the CPSU. This is especially evident for the period following the March 1965 Plenum of the CPSU Central Committee. As noted at the November 1979 Plenum of the CPSU Central Committee, during the last 15 years over 400 billion rubles have been directed into agricultural development. In the final year of the 10th Five-Year Plan 173 billion rubles have been allocated for this purpose. This is much more than foreseen by the basic directions for the development of the national economy during the 10th Five-Year Plan.

In economic competition with capitalism USSR agriculture has achieved serious success. Whereas in 1949-1953 the production volume of this branch of the economy of our country comprised only 55 percent of the production volume of the USA, in 1956-1960 it already comprised 70, in 1961-1965--about 75 and at the present time--over 85 percent.

The advantages of socialism are evident. The country's successes in increasing agricultural production output, in the growth of labor productivity of rural workers as well as in an accelerated solution to the important socio-economic problems of the Soviet village are tied to the creation of the largest and most highly mechanized agriculture in the world, namely to the kolkhoz-sovkhoz system.

At the same time we should note that bourgeois apologists of the west are constantly trying to prove their ideas about the "fall" and "destruction" of Soviet socialist agriculture, claiming that despite the great capital investments it will not be possible to eliminate the alleged existing crisis in Soviet agriculture.

We know that in agriculture natural (biological) and economic processes are most closely intertwined. The higher the level of production strength of a society in a specific country, the greater the role played by economic factors (fertilizer, technical means, the utilization of new technology, scientific achievements, etc.). The economic fertility of the soil increases. In connection with this in analyzing the status of agriculture we must always keep in mind the natural-economic conditions as well as specific economic possibilities which are accessible to the particular country at the given moment.

In the USSR agriculture is managed on a huge territory encompassing two continents. The natural-climatic conditions for agriculture in our country are severe and unstable. No other large country in the world has to face such serious problems in eliminating their negative effects on production as the USSR. In the USA, for example, 5 percent of the plowland is located in regions with an average annual temperature of +5°; in the USSR--60 percent is. In the USA the area with annual precipitation greater than 700 mm is 60 percent of the total; in the USSR--1.1 percent. In the USA there are no areas of plowland in regions with insufficient moisture (less than 300 mm of water), whereas in the USSR almost 65 percent of the crops are in such areas. According to the calculations of agroclimatologists, on the average the natural conditions for agricultural production are 2-2.5 times poorer in the USSR than in the USA.

Our agriculture, located on great expanses and in severe natural conditions, is frequently subject to calamitous annual fluctuations in weather. In recent years there were severe droughts in the USSR in 1963, 1965, 1967, 1972 and 1975. The year 1979 was difficult for managing agricultural production. As a whole over 60 percent of the country's territory is periodically subject to drought and other unfavorable climatic effects. Under normal conditions this zone provides 75 percent of grain that is procured. The following data demonstrates the effect of the driest years on the productivity and total production of grain in the country. Whereas on the average for 1966-1970 the productivity of grains was 13.7 quintals per hectare and gross production was 167.6 million tons, in 1967 the respective figures were 12.1 and 147.9 million tons. Whereas on the average during the 1971-1975 five-year plan, which was unfavorable in weather conditions, productivity was 14.7 quintals per hectare and gross production was 181.6 million tons, in 1975, the driest year, the respective figures were 10.9 quintals per hectare and 140.1 million tons. During 1976-1978, more favorable in weather conditions, productivity was 17.0 quintals per hectare and gross yield was 219 million tons. In 1979, with difficult weather conditions, gross grain yield was 179.0 million tons.

The indicators that have been presented objectively reflect the situation and at the same time attest to the fact that the special characteristic of the present stage in the development of agriculture in our country, using grain production as the example, is the dynamic, rapid growth of public production on the basis of complex mechanization and electrification, the extensive utilization of technical means and the completion of reclamation projects on a large scale. Even the most prejudiced critic cannot ignore the dynamics of these figures.

However, our enemies select the indicators of the drought years and try to make "generalized" conclusions on their basis. They attempt to explain failed harvests by the essence of the socialist way of developing agriculture. These attempts are clearly unsound and propogandistic in nature. If we use the "logic" of bourgeois critics of the Soviet way of developing agriculture we would come to the conclusion that the reason for great calamities and low harvests in a number of capitalist countries is solely the capitalistic system of production. This is what occurred in 1976 in England, France and other countries when drought brought great losses to industrial and agricultural production.

The socialist system of planning and management enables us to effectively maneuver resources and to secure expanded production in the country's national economy without complications in supplying the population with foodstuffs, as occurs within the framework of the capitalist world. Nevertheless, our critics prefer to keep silent about this.

During the most difficult weather-climatic conditions our country found it necessary to turn to purchases of a certain quantity of grain. In making use of these facts, bourgeois propoganda not only distorted the purpose and goals of grain purchases, but also blamed the USSR for increasing the world food problem and for the sharp rise in world food prices. Actually the situation was completely different. The Soviet Union has had and continues to have a policy that encourages the stabilization of prices on the world's markets.

The exacerbation of the world food problem today is based on many circumstances and is complex in nature. The food problem today is not only economic, but political as well; agricultural production is taking on more of a strategic character. The production problem is indissolubly related to the ideological battle because its solution is impossible without the solution of the fundamental socio-economic problems of the village, especially in developing countries.

However, it would be incorrect to say that the only reason for the exacerbation of the food problem is the backwardness of agriculture in developing countries. It is important to note that agriculture in a number of developing countries cannot keep up with socio-economic changes and with the restructuring of the means for feeding the population.

It must be noted that only the USA and Canada are in a position to fully meet their needs for feed grain. Other economically-developed countries do not produce enough and satisfy some of their need through imports.

The accelerated development of USSR agriculture is one of the most important economic goals for today. The course taken by the CPSU for the overall development of agriculture will encourage not only the continued growth of the well-being of the Soviet people but also the development of possiblities to increase aid to the peoples of other countries.

The USSR is one of the leading granaries in the world. In recent years production output in farming and livestock raising have been growing steadily as a result of the growth in the level of industrialization in agriculture. Moldavia is one of the brother republics that can serve as an example of the cultivation of grains using industrial technology. From one year to the next it produces large harvests. The country as well as the republic have sufficient quantities of grain at their disposal. However, it is by far not used efficiently everywhere. In Moldavia up to 50 percent of the grain (according to nutritive value) is used in cattle rations. At the same time worldwide practices and the experience of leading enterprises in the country speak of the fact that when rations are well-balanced in protein it is possible to produce high-quality beef without using concentrates.

It is the task of propogandists, lecturers, specialists and administrators in agriculture to fight to fulfill the party's requirements regarding the efficient and economic utilization of grain.

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REGIONAL DEVELOPMENT

UDC 633.1:631.1(87)

USA-CANADIAN EXPERIENCE IN GRAIN PRODUCTION

Moscow ZERNOVOYE KHOZYAYSTVO in Russian No 4, Apr 80 pp 38-40

[Article by V. G. Pozdnyakov, candidate of economic sciences of the USSR MSKh [Ministry of Agriculture]: "The Utilization of Experience in Grain Production"]

[Text] Industrially highly-developed North American countries--the USA and Canada--have achieved significant goals in grain production. In 1978 average production was 1.2 tons per person in the USA and 1.8 tons per person in Canada. The experience gathered here regarding the organization of grain production is undoubtedly of interest for the farmers of various zones in our country.

However, in utilizing foreign experience we should consider certain special characteristics and differences in agricultural management as well as the fact that the agricultural aims in the Soviet Union and in the USA and Canada are contrary in their socio-economic essence. Without taking soil-climatic conditions into account, we should note that grain production in the USSR as well as in the North American countries takes place under conditions of government regulation, which differ in all three countries.

In the USSR grain production is the subject of constant concern by the party and state. The persistent growth of gross grain yield is the basis for the stable development of all agricultural production. In accordance with the decisions of the July 1978 Plenum of the CPSU Central Committee it is planned to produce no less than 1 ton of grain per person in the USSR by 1990. This is the basis for the long-term program for the development of the branch and the determinant for kolkhozes and sovkhozes of the basic directions of intensification necessary to achieve the goal under specific production conditions. In addition, guaranteed procurement prices and a 50-percent bonus for above-plan sales of grain enable us to manage this branch and produce optimal profits. State procurement prices for grain do not depend on the state of the world market.

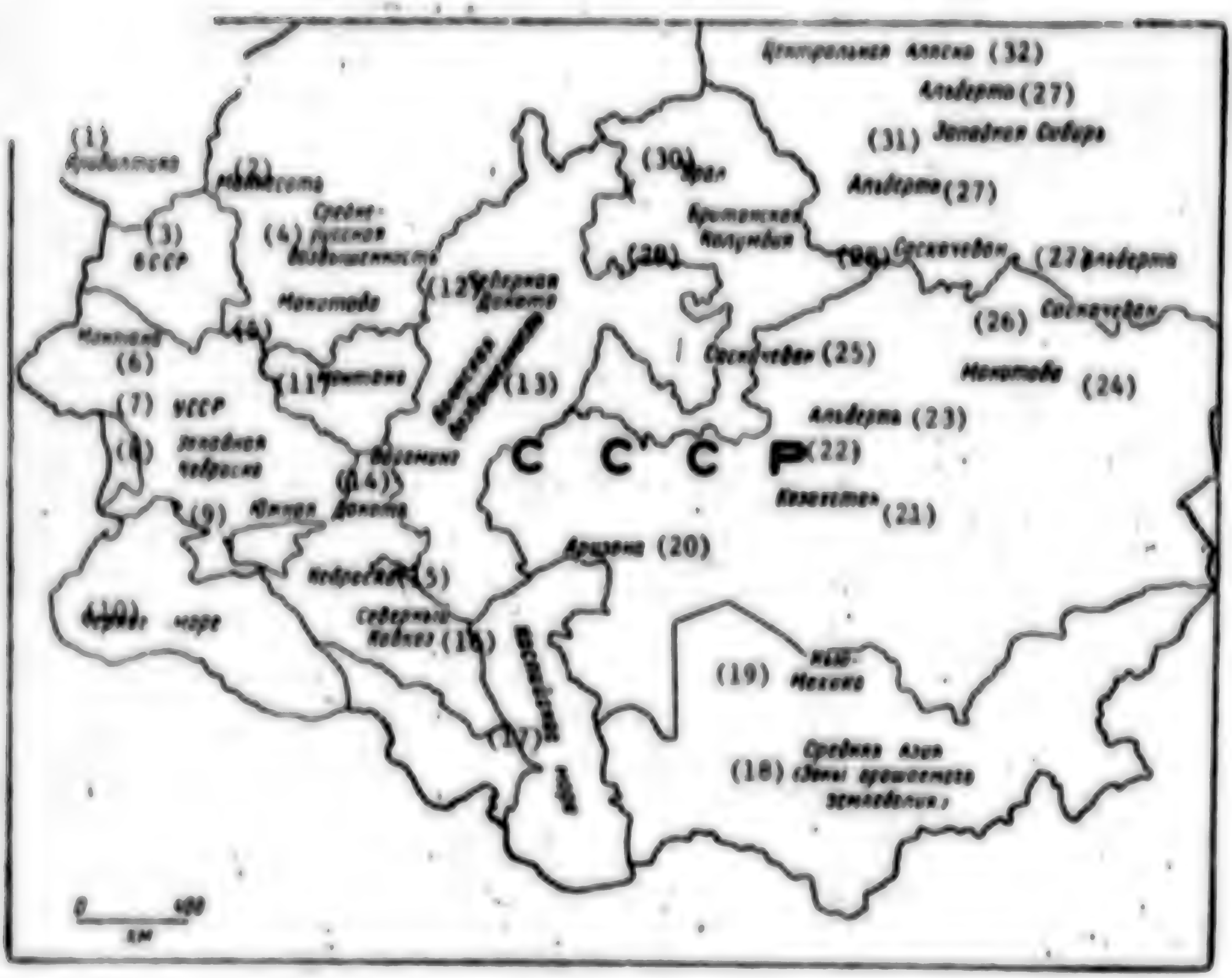
In Canada and the USA grain production occurs under conditions of monopolistic state capital. The existing systems of state regulation in these countries are essentially the same, although they do differ in form (in the USA the government provides bonuses for curtailing the sowing area, for the production of certain crops, guaranteed procurement prices, etc.; in Canada regulation occurs mainly through the sale of products). In both countries conditions exist for the profitable management of the grain industry in large and average enterprises. Difficult and sometimes impossible conditions are created for the small producer. Suffice it to say that in the USA over 100,000 farms are ruined each year--since 1963 the total number of farms in this country dropped from 3,752,200 to 2,680,200 in 1978. During the period 1961-1978 the number of farms in Canada decreased by almost half--from 588,000 to 300,200.

The other factor in utilizing the experiences of the USA and Canada that must be given attention is the comparability of soil-climactic conditions. It is common knowledge that the natural conditions in the USA, particularly the temperature regiment during the vegetative period, precipitation, the number of sunny days and several other factors, are more favorable than in the USSR. It is felt that on the average the bio-climatic coefficient in the USA is 2.2 times higher. In other words, by expending the same effort there as here it is possible to achieve a productivity that is 2.2 times larger. At the same time there are regions in the USA which are very similar to ours in natural conditions.

If we place a map of selected regions of the USA and Canada over a map of regions in our country with the same natural conditions (remembering that even within a particular section there will be microzones) we obtain a picture like the one in the sketch. The leading grain zones of Canada--the region of the Canadian prairies (in the provinces of Manitoba, Saskatchewan and Alberta)--are placed over the rayons of Western Siberia and Northern Kazakhstan according to idential conditions. British Columbia coincides with the rayons of the Urals according to many common natural characteristics of production. As we know, the rayons of Western Siberia, Kazakhstan and the Urals belong to the zone of "risky farming." As for comparable soil-climatic analogues of farming regions in the USSR and the USA, it should be noted that natural productivity is higher in the latter. The most fertile lands in this country, particularly the region of the "corn belt," do not have analogues in the USSR, with minor exceptions. Similarity to the rayons of the Baltic States, the Ukraine, Belorussia and the Northern Caucasus is found in the states of the "wheat belt" of the northern plains--North Dakota, South Dakota, Nebraska, Kansas and Montana. These regions are characterized by fertile soils, flat relief and insufficient precipitation (400-600 mm per year) with strong fluctuations from year to year. The rayons of the Povolzh'ye have more in common with the state of Wyoming with its sharply continental climate.

The third factor to consider is the technical-technological aspects of grain production in the Canadian prairies, the wheat belt of the USA's northern plains and similar regions in our country.

Map of the Climatic Analogues of USSR and USA



Key to map:

1. Baltic States
2. Minnesota
3. BSSR
4. Central Russian Plateau
5. Manitoba
6. Montana
7. UkSSR
8. Western Nebraska
9. South Dakota
10. Black Sea
11. Montana
12. North Dakota
13. Volga plateau
14. Wyoming
15. Nebraska
16. Northern Caucasus
17. Caspian Sea
18. Central Asia (irrigated farming zone)
19. New Mexico
20. Arizona
21. Kazakhstan
22. USSR
23. Alberta
24. Manitoba
25. Saskatchewan
26. Saskatchewan
27. Alberta
28. Saskatchewan
29. British Columbia
30. Urals
31. Western Siberia
32. Central Alaska

Table 1

Indicators	Provinces					
	Alberta		Manitoba		Saskatchewan	
	Thousands of ha	%	Thousands of ha	%	Thousands of ha	%
Area utilized (in crops, fallow)	8,700.0	100	4,055.5	100	16,954.0	100
Sowing area in wheat	1,942.1	22.3	1,290.0	31.8	6,557.0	38.7
including after fallows	1,417.7	73.0	567.6	44.0	5,442.1	83.0
Area of fallows	2,873.0	33.0	930.0	22.9	7,200.0	42.5

The history of the agricultural assimilation of the steppe regions of the USA and Canada is related to the development of several negative phenomena. Thus, the application of European technology for soil cultivation resulted in the development of wind erosion and a sharp drop in productivity. In the 1930's on a large area the productivity of grain crops dropped to 4-5 or in some years to 1-2 quintals per hectare. The existing situation required the passage in both countries of legal, economic and organizational measures directed at seeking out effective methods of combatting wind erosion of the soil and of restoring the fertility of eroded lands. It was possible to achieve these goals as a result of the elaboration and introduction of the soil-conservation means of cultivation and of short crop rotations. Soil was to be cultivated shallowly (10-12 cm) and stubble was to be left on the surface of fields. In the Canadian prairies the tactics used consist of cultivating wheat in a crop rotation of fallow--wheat or fallow--wheat--wheat (or another grain crop). Despite the extending use of herbicides and the possibility of decreasing the area in fallow, this method remains the most important link in the farming system of the Canadian prairies (1977, Table 1).

Soil-conservation technology of soil cultivation with the retention of stubble has many variants, but it can be reduced to the two basic technologies--minimal and zero. In the first case the number of operations in comparison with regular cultivation is curtailed; in the second the grains are sown directly into the stubble without a preliminary cultivation of the soil. Minimal and zero cultivation have become particularly widespread in the USA, where in 1978 they were utilized on 26.9 percent and in

Table 2

State, duration of observation (years); crop rotations	Productivity of wheat (quintals per hectare)	Average annual precipitation (mm) 1931-1960
Montana--9; wheat-fallow	21.5	342
wheat-barley-fallow	26.2	342
Nebraska--56; wheat-fallow	21.0	437
wheat monoculture	8.3	437
Colorado--60; wheat-fallow	14.6	420
wheat monoculture	5.0	420

1979 on 29.3 percent of the total area as compared with 18 percent in 1972. In some states such as Kentucky, Georgia and Delaware minimal and zero cultivation are utilized on 75 percent of the sowing area.

An interesting direction taken to improve soil-conservation cultivation was the system of "ecological fallow" for regions with insufficient moisture in the USA. This is essentially a minimal cultivation in which mechanical action on the soil is replaced by the chemical treatment of weeds. The latter enables farmers to raise corn or sorghum in a crop rotation of fallow--winter wheat--corn (or sorghum) instead of the traditional rotation of fallow--wheat.

The technology for cultivating the soil is the following. After the harvesting of corn mechanical soil cultivation (discing without removing post-harvest corn residue from the fields) takes place in early May. This retains 10-13 mm of moisture from precipitation. In June and July the soil is cultivated with sweeps. In August 67-90 kilograms per hectare of phosphorus fertilizers and microfertilizers are applied (to wheat and corn). Nitrogen fertilizers (anhydrous ammonia at a rate of 45-56 kilograms per hectare of active matter) are applied during the second cultivation (in traditional cultivation on fallow fields there are another 4-5 mechanical cultivations). After the wheat is harvested the soil is treated with a mixture of parakvat and atrazin and not touched until the spring of the following year, when corn is sown.

The results of 13 years of research conducted in the University of Nebraska demonstrate that moisture losses in "traditional" fallow is 50 mm as compared with only 18 mm when utilizing the system of "ecological fallow." Every additional 25.4 mm of moisture secured the production of over 6.7 quintals of wheat per hectare. In noting the similarity in the technology and machine systems for cultivating grains in the steppe regions of both North American countries (Canada exports a significant number of these machines from the USA), we should mention the essential differences in the levels of intensification of grain production. In the USA the level of management of the branch is much higher than in Canada. Thus, whereas in the Canadian prairies irrigated areas are insignificant, in the USA in the similar states of Montana, Nebraska, Wyoming, Kansas, North Dakota and South Dakota about 4 million hectares are irrigated. In the USA fertilizers and chemicals to protect crops are utilized in large quantities. Nevertheless, Canadian farms in the steppe provinces achieved fairly good indicators in developing the grain industry. Since 1952 the yield of wheat in the Canadian prairies has remained a stable 17-20 quintals per hectare of grain.

Of particular interest are the technical means of soil-conservation cultivation in the USA and Canada, the introduction of combined machines and equipment which simultaneously complete up to five technological operations, machines with active working parts, and the development of new chemicals and biological methods for combatting weeds and pests. We should study the experience of farmers in the Canadian prairies who introduced systems of combatting malicious weeds such as wild oats by coordinating agrotechnical methods with the application of herbicides.

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REGIONAL DEVELOPMENT

UDC 65.012.122+631.559

GEOGRAPHY OF PROGRAMMED SIBERIAN HARVESTS

Omsk ZEMLYA SIBIRSKAYA, DAL'NEVOSTOCHNAYA in Russian No 2, Feb 80 pp 16-19

[Article by K. P. Afendulov, corresponding member of VASKhNIL, Ukrainian Scientific Research Institute of Feeds; A. A. Lyakh, candidate of agricultural sciences, Siberian Scientific Research Institute of Feeds, and M. I. Chernikova, West Siberian Regional Scientific Research Hydrometeorological Institute: "The Geography of Crop Programming"]

[Text] Crop programming, previously considered only theoretical scientific research, now includes a wide geographic range throughout the country and is being successfully introduced into agricultural production from the Ukraine and Moldavia to the Far East. For example, data from literature indicate that almost all of the country's union republics have developed operations to program crops. However, we should mention only those scientific research institutions and vuzes in which these operations are underway on the widest scale and which have already obtained results in production tests. Among these are the Moscow Agricultural Academy imeni K. A. Timiryazev, the Ukrainian Scientific Research Institute of Irrigated Agriculture, the All-Union Scientific Research Institute of Corn, the Belorussian Agricultural Academy, the Belorussian Scientific Research Institute of Soil Science and Agronomy, the Volgograd, Kherson, and Kishinev agricultural institutes, the Tartu Scientific Research Institute of Agriculture, Chernigovskaya Oblast Agricultural Experimental Station, the Siberian Scientific Research Institute of Feeds, the Siberian Division of VASKhNIL, and the West Siberian and Far East scientific research hydrometeorological institutes.

In 20 years of experiments the Moscow Academy received the following per hectare yields which were close to those planned: 262 quintals of winter rye for green fodder, 255 quintals of vetch-oat mixutre for green fodder, 77 quintals of perennial grass hay, 704 quintals of feed cabbage, 377 quintals of corn for silage, and 284 quintals of sugar beets. In tests at the Tartu Scientific Research Institute of Agriculture on programmed plantings the following per hectare yields were obtained: 79.4 quintals of winter wheat, 64 quintals of winter rye, 106 quintals of alfalfa hay, 500 quintals of green mass from peas, and 55 quintals of peas for grain, The method of optimum crop programming is being introduced most widely into agricultural production in the Ukraine. During the first stage of its introduction (1968-1973) in farm sowings conducted under the methodical supervision of the Chernigov Experimental Station, individual brigades on kolkhozes and sovkhozes obtained a per hectare yield of 45 to 48 quintals of winter wheat, 35 to 47 quintals of rye, 70 to 109 quintals of corn for grain, 30 to 40 quintals of barley, 300 quintals of potatoes, 600 to 700 quintals of root crops, and 25 quintals of buckwheat. At the present time in the Ukraine fertilizers are being applied to an area of about 5.2 million hectares of planned crops. The planned yield per hectare is quite high: over 40 to 50 quintals of grain, 70 to 80 quintals of corn, 300 to 350 quintals of potatoes, and so forth.

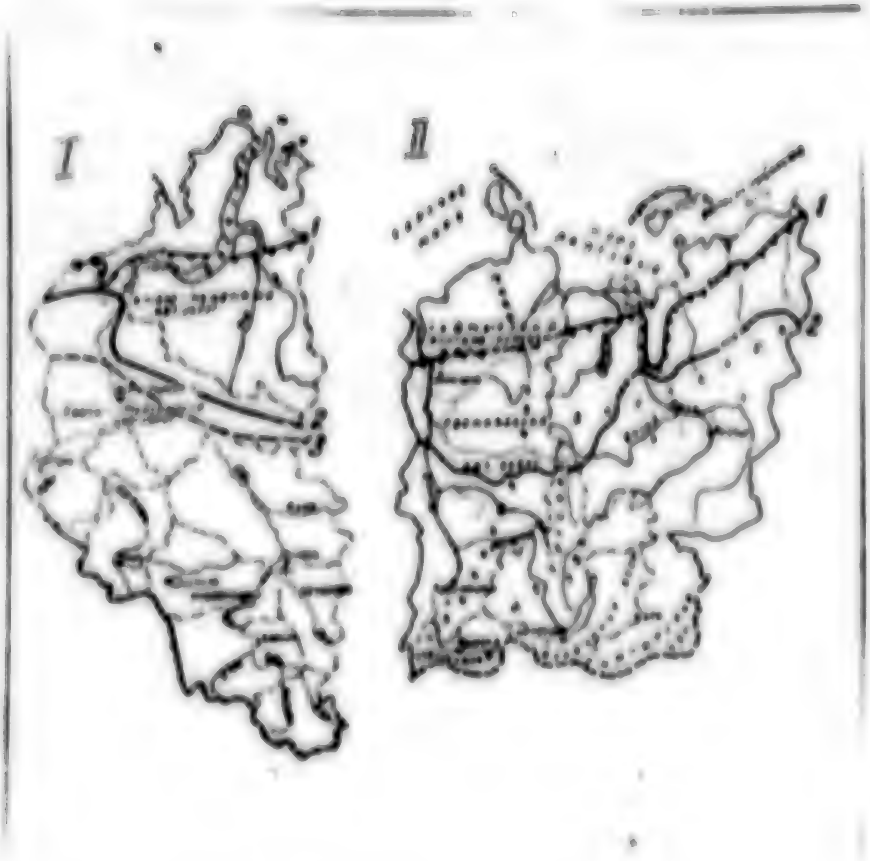
Similar research was begun much later in Siberia (1973) and the Far East (1976). Much work to establish the potential and actually possible productivity of the climate in Western and Eastern Siberia and in the regions of Baykal-Amur Trunk Line (BAM) construction has been done in a short time by the Siberian Scientific Research Institute of Feeds and the West Siberian and Far East scientific research hydrometeorological institutes.

As you know, the initial factors in producing a crop are solar radiation, carbon dioxide, water, and mineral nutrition. Therefore, according to K. P. Afendulov and M. I. Chernikov (1976), the first stage in obtaining programmed yields geographically is the completion of an optimum (for agroclimatic conditions) computation of the distribution of agricultural crops by area with an estimate of their possible yield.

Light is a potential source of the productivity of cultivated plants. It has been established that 90 percent of the yield is formed through solar energy and the carbon dioxide of the atmosphere, and all agricultural methods are directed at optimizing the photosynthesis activity of plants (I. S. Shatilov, 1973).

According to present-day concepts, in the process of photosynthesis the plant cover does not use the entire spectrum of solar radiation, but only its physiologically active part found found in the range of wave lengths between 0.38 and 0.71 microns. They call this area of the spectrum photosynthetically active radiation (FAR). Consequently, the maximum possible yield depends primarily on the FAR present during the vegetation period and the most efficient use of it during its formation.

Under specific soil and climatic conditions the actually possible yield is determined by maximum possible realization by crop coenoses of one of the limiting agroclimatic factors, more often heat or moisture. These factors, according to our research are a reliable criterion of the most efficient use of FAR in forming the yield. The theoretically possible potential and acutal yield for three groups of crop plants (grain, roots, tubers and green biomass) is shown in the following table and drawing by oblast, kray, and autonomous republic in Western and Eastern Siberia.



The theoretically possible (potential) and actual yield of three groups of cultivated plants by oblast, kray, and autonomous republics in Siberia.

I. Western Siberia
II. Eastern Siberia

1. The border of oasis raising of vegetable crops requiring little heat (radishes, lettuce, spinach, bunch onions, turnips, and potatoes which do not reach full maturity)
2. The border for raising early crops -- gray grains, legumes, potatoes (for Eastern Siberia -- corn for silage)
3. The border for raising corn for silage.

Table Key

1. Oblasts, kraya, autonomous republics (oblasts)
2. Potential
3. Actually possible
4. Grain
5. Potato tubers
6. Green biomass
7. Western Siberia
8. Tyumenskaya
9. Omskaya
10. Tomskaya
11. Novosibirskaya
12. Kemerovskaya
13. Altayskiy
14. Gorno-Altayskaya Autonomous
15. Eastern Siberia
16. Yakutskaya
17. Chitinskaya, Buryatskaya
18. Irkutskaya
19. Krasnoyarskiy
20. Tuvinskaya
21. Khakasskaya Autonomous

Yields of Basic Groups of Cultivated Plants with 2% (numerator) and 5% (denominator) FAR Utilization (quintals per hectare)

1 Области, края, автономные республики (области)	2 Потенциальные			3 Реально возможные		
	4 зерно	5 клубни картофеля	6 зеленая биомасса	4 зерно	5 клубни картофеля	6 зеленая биомасса
7 Западная Сибирь						
8 Тюменская	31—77 77—193	125—325 312—812	250—650 625—1625	31—77 77—193	125—325 312—812	250—650 625—1625
9 Омская	67—82 168—206	275—350 688—875	550—700 1375—1750	64—82 161—206	275—350 688—875	550—700 1375—1750
10 Томская	62—72 153—181	250—275 625—688	500—550 1250—1375	62—72 153—181	250—275 625—688	500—550 1250—1375
11 Новосибирская	67—82 168—206	275—350 688—875	550—700 1375—1750	60—82 148—206	275—350 688—875	550—700 1375—1750
12 Кемеровская	67—72 168—181	275—300 688—750	550—600 1375—1500	67—72 168—181	275—300 688—750	550—600 1375—1500
13 Алтайский	72—88 181—219	300—400 750—1000	600—800 1500—2000	57—88 142—219	275—400 688—1000	550—800 1375—2000
14 Горно-Алтайская автономная	80 200	300 750	600 1500	30—80 64—200	125—300 312—750	250—600 625—1500
15 Восточная Сибирь						
16 Якутская	41—60 103—148	200—288 500—720	400—575 1000—1440	31—60 77—148	150—288 375—720	300—575 750—1440
17 Читинская, Бурятская	51—54 129—135	250—262 625—655	500—525 1250—1310	39—54 97—135	188—262 470—655	375—525 940—1310
18 Иркутская	47—57 116—142	225—275 562—688	450—550 1125—1375	39—57 97—142	188—275 470—688	375—550 940—1375
19 Красноярский	41—57 103—142	200—275 500—688	400—550 1000—1375	36—57 90—142	175—275 438—688	350—550 875—1375
20 Тувинская	60 148	288 720	575 1440	36—60 90—148	175—288 438—720	350—575 875—1440
21 Хакасская автономная	57 142	275 688	550 1375	54—57 135—142	262—275 655—688	525—550 1310—1375

In calculating the potential grain yield in the territory of Western Siberia FAR energy is computed during the period of possible vegetation of early spring grain crops (from the date air temperature rises permanently above 5°C in the spring, taking into account the transition to a soft plastic stage, to the date air temperature becomes 10°C in the fall). In Eastern Siberia the FAR energy and yield were calculated for the period June through August for all three groups of cultivated plants.

The caloric value of a unit of organic substance yield was established at 4,000 kilocalories in the formation of one kilogram of absolutely dry organic mass.

The actually possible yield was calculated according to moisture provision to the plants. It is common knowledge that to achieve high plant productivity it is necessary that plants have 250 to 750 cubic meters of water available for transpiration, about 25 to 35 kilograms of nitrogen and potassium, 10 to 15 kilograms of phosphorus, and about 100 kilograms of the remaining mineral elements, calculated per billion FAR energy units available during the vegetation period with one percent of it used for photosynthesis and storage in the crop (G. P. Ustenko, 1971, A. A. Nichiporovich, 1976).

There is information that of the total precipitation only 20 to 30 percent is used in crop formation; less than 10 percent goes to run-off; and the rest evaporates from the soil surface. With a high level of agriculture 70 percent of it can be used by cultivated vegetation. Considering the present level of scientific and technical progress in agriculture, we used for the computations the annual amount of precipitation with possible losses up to 30 percent and providing a FAR energy allowing for 750 cubic meters at one percent. As K. P. Afendulov and M. I. Chernikova (1976) point out, such an approach to yield computation not only increases the precision of its determination, but also makes it possible to develop methods for solving mathematically problems of optimizing conditions for raising agricultural crops.

The potential and actually possible yield in Siberia is quite high. A high yield can be obtained in Eastern Siberia and in the area of BAM construction. Taking into account the provision of heat and moisture to the cultivated plants, it is possible in the BAM zone to obtain the following per hectare yield in the Predbaykal'ya: 35 to 40 quintals of grains, 230 to 320 quintals of root crops and tubers, and 380 to 520 quintals of green biomass. In the Priamur'ya the actually possible yield is higher still and can reach the following per hectare yields: 60 to 70 quintals of grain, 400 to 450 quintals of root crops and tubers, and 750 to 880 quintals of green biomass.

The results of theoretical computations of the climate potential were approved for various farms, like the Posevnoye Experimental Model Farm in

Novosibirskaya Oblast. In the period 1973 to 1978 here calculated amounts of fertilizers allowed the Siberian Scientific Research Institute of Feeds to obtain a per hectare yield of green biomass of 350 to 400 quintals of corn and 450 to 500 quintals of sunflowers under natural moisture conditions and 700 to 800 quintals of corn, 360 to 420 quintals of potatoes, and 35 to 52 quintals of barley, feed beans, and oats under irrigation. Especially interesting results were obtained in 1977. In an experiment a yield of 1,163 quintals of feed beets and 816 quintals of corn was obtained per hectare.

Research by the Siberian Scientific Research Institute of Feeds (1976-1977) and the West Siberian Regional Scientific Research Hydrometeorological Institute (1977) established that it is possible to obtain up to 200 to 210 quintals of green mass from oats and leguminous mixtures and up to 378 quintals of sunflowers per hectare in regions of BAM construction (Dzheltulakskiy Rayon, Amurskaya Oblast).

A comparative evaluation of the theoretically estimated yield and the actual yield of industrial sowings and state variety plots is very interesting. For example, the following per hectare yields of spring wheat were obtained: 86 quintals on the Molodaya Gvardiya Kolkhoz in Shipunovskiy Rayon, Altayskiy Kray, 70 quintals in Nizhnetavdinskiy Rayon, Tyumenskaya Oblast, 66.1 quintals on the Kuytunskiy State Strain-Testing Plot in Irkutskaya Oblast, and 40 to 43 quintals on the Olekminskiy State Strain-Testing Plot in Yakutskaya Oblast. They also obtained here yields of other crops (potatoes, corn) close to the estimated yields through optimum use of technology at the level of biological requirements of the crop for environmental factors.

Research carried out over a large area in Western and Eastern Siberia indicated that the limiting factor in guaranteeing high plant productivity is not moisture, but heat, which in turn is limited by the FAR useful energy. Thus another question arises: by what means can we assure efficient utilization of natural moisture reserves to increase field productivity in Siberia? Only work aimed at implementing a method of optimum yield programming can provide an answer to this question.

On a countrywide scale this problem, in our opinion, should be resolved in close collaboration with the institutions of the USSR State Committee on Hydrometeorology and Control of the Natural Environment (Goskomgidromet) and VASKHNIL. This is explained by the fact that only Goskomgidromet has at its disposal a data bank and prognostic information about day-to-day weather necessary to calculate potential and actually possible yields in long-range planning and also to correct long-range yield programs given the agro-meteorological conditions of a specific year. Each of the above named institutions must include the following among its obligations: Goskomgidromet institutions must estimate the potential and actually possible yield, VASKHNIL institutions must be entrusted with developing technologies for the programmed raising of agricultural crops, and Goskomgidromet and VASKHNIL institutions must jointly supervise the progress of crop formation.

In 1977 the Siberian Division of VASKHNIL established a complex research sector to put into practice in agricultural production the above measures on the basis of research carried out by the Siberian Scientific Research Institute of Feeds and the West Siberian Regional Scientific Hydrometeorological Institute. Its goal is to increase the yield of grain crops by programmed interference in crop formation given the specific agroclimatic conditions of a specific year.

Seven scientific research institutes participated in a scientific production experiment. In 1978 the experiment was carried out on 53 hectares on the Elitnoye Experimental Model Farm of the Siberian Division of VASKHNIL. The fact that a long-range program for yields, "Zerno", was developed by the sector was the most significant feature of the experiment. This means that the specific maximum possible yield which is assured by climate resources in a given soil and climatic zone is incorporated into the long-range program, with consideration for scientific and technical progress in agriculture.

The essence of the long-range scientifically sound programming of yields consists in focusing in each specific year all attention on how weather conditions in that year are shaping up, what adverse effect they may have on the progress of crop formation, and what present-day methods can be brought to bear on the bad complex of weather conditions so as to minimize crop losses. To this end a program for correcting the crop under existing agrometeorological conditions in a specific year is being developed at the West Siberian Hydrometeorological Center. For example, in 1978 a correction in the crop and sowing schedule was introduced into the "Zerno" program of the Siberian Division of VASKHNIL, with consideration for the correction program. The selected optimum sowing schedule made it possible to curtail the effect of bad weather at the most crucial point of plant growth and development -- the moment of ear setting. The yield of Novosibirskaya-67 spring wheat turned out to be close to the estimate: it ranged from 30.7 to 35.1 quintals per hectare by field and 32.7 to 38 quintals per hectare (32 to 40 quintals according to the long-range program and 39 according to the corrected program) for the record plots.

All the data cited concerning the yield indicate the great biological potential of the climate not only of the European sector of the country, but also in Siberia and the Far East. Consequently, the success of introducing the method of yield programming into agricultural production is determined to a great extent by skill in estimating the planned yield. Programming principles (I. S. Shatilov, 1973) also provide an answer to this question.

According to research data from the West Siberian Regional Scientific Research Hydrometeorological Institute and the Siberian Scientific Research Institute of Feeds, Western Siberia possesses great biologic potential.

Moreover, it has been established that not more than one third of the climate resources are being used in a large part of the area and even less are being used in the northern regions. This under-utilization of climate resources is explained, on the one hand, by objective natural factors (drought, hail, dry winds, and so forth), and on the other by economic measures. Their under-utilization can be explained to a considerable degree by poor soil quality: according to the conclusions of the Siberian Scientific Research Institute of Agricultural Economics, the balance of nutrients in Siberian soil is negative.

Intelligent farm management aimed at optimum crop programming acquires more and more importance in regard to more fully utilizing natural resources to increase agricultural crop yields. To achieve this it is first of all necessary to know the natural factors in the climate-soil-vegetation system, since the balance of heat and moisture determines the mobilization of nutrients accessible to the plants from its potential resources.

We believe that at the present time the kolkhozes and sovkhozes in Siberia and the Far East have everything necessary to introduce the method of optimum yield programming. The majority of them have at their disposal a powerful arsenal of technical means and are staffed mainly by specialists with higher educations. All this gives us the right to project the success of crop programming.

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TILLING AND CROPPING TECHNOLOGY

INDUSTRIAL APPROACH TO FARMING PROCEDURES TESTED

Moscow IZVESTIYA in Russian 25 Apr 80 p 1

[Article by O. Pavlov: "Industrial Technology for Agriculture"]

[Text] The new so-called industrial technology for field crop cultivation is producing good economic results and to a considerable extent is counteracting the effect of unfavorable harvest conditions, as has been shown by experiments recently carried out in various zones of the country.

For example, during the past 2 dry years in Chadyr-Lungskiy Rayon in the south of Moldavia per-hectare yields increased on dry farmlands of the kolkhozes an average of 26 to 55 quintals in the case of grain crops and 17.3 to 23.6 quintals in the case of sunflowers overall. In the process labor outputs dropped two to three fold.

The Slobodzeyskiy, Grigoriopol'skiy, and Novoanenskiy mechanization associations of this republic harvested on the average 346 quintals of vegetables per hectare last year. This previously unprofitable branch began to yield stable profits. The commercial value of vegetable growing in rayons producing them for sale rose from 40 to 64 percent.

On the Progress Kolkhoz in Izmail'skiy Rayon, Odesskaya Oblast, the team of N. Kalaydzhi harvested approximately 35.1 quintals of soy grain in the fall of 1979. As we know, the soy kernel contains 35 to 45 percent high quality protein and 18 to 23 percent fat. Thus, in terms of protein, the harvest brought in by N. Kalaydzhi's team was equivalent to 153 quintals of barley per hectare. And this is without counting the protein-rich straw. Krymskaya Oblast as a whole obtained a per hectare yield of 17.8 quintals of soy grain, while Chernovitskaya Oblast obtained 12.8 quintals on non-irrigated lands. At the same time the figures were an average of 7 quintals in Khersonskaya Oblast and 4 quintals in Kirovogradskaya Oblast.

It should be noted that all these high yields were obtained on lands and kolkhozes where they had applied the new industrial technologies intelligently. What is the crux of the matter?

Take corn, for example. It is above all plagued by weeds. It loves heat, has a powerful stalk and broad leaves. It needs a great deal of sunlight, and its roots need lots of moisture, particularly in the initial growth stages. Weeds initially outstrip it in development and take the sun's rays and moisture away from the cultivated plants. Later on the corn escapes the captivity of the weeds, but precious time is lost and a good harvest is not obtained. In the traditional procedure mechanizers have fought and continue to combat weeds with the aid of mechanical equipment and devices which the tractor drags along between the rows. During the season they make four to five cultivations. These endanger the plants and dry out the soil, and there is no equipment which can completely destroy the weeds without damaging the plants.

Industrial technology stipulates a very high degree of precision and timing of work which assures the orderly positioning of the seeds where each plant has its completely unique area for feeding and receives the same amount of sunlight as all the others. This is achieved by special seeders with an electronically controlled dispensing unit. Weeds are destroyed by a quick acting herbicide. There is a great deal of precision in the new technology, but perhaps the main thing is to complete all the basic preparatory operations for working the soil in the autumn. In the spring the mechanizers only level the fields, seed, and apply fertilizer -- that is all. Not one more machine goes out onto the fields until the harvest.

It is on this principle of industrial technology that the raising of soybeans, vegetables, sunflowers, flax, and sugar beets is based. Last year corn was cultivated according to the new method on 160,000 hectares -- including 100,000 hectares in Moldavia. This whole area in Moldavia obtained an average yield of 49.1 quintals of grain per hectare. Industrial technology for other crops was tried out on comparatively small plots in various regions of the country. The total area on which the new technology will be employed is now being expanded to 2.5 million hectares. Of this total 1.1 million hectares will be devoted to corn, 210,000 to soybeans, and 600,000 to sunflowers. These figures have been carefully calculated and checked at various management and planning levels. The entire 2.5 million hectares today has all that is necessary -- equipment, herbicides, and fertilizers.

This, however, does not mean that these lands will automatically produce a good harvest. No, this can be accomplished only by skill, diligence, knowledge, and efficient provision of material and equipment to all teams in the technological chain. The harvest also depends on the agricultural workers and their partners whose role and responsibility have increased appreciably under the new system. The famous Moldavian corn grower, Hero of Socialist Labor Z. Paskalov, told me that he calculated, for example, that last year his team lost 10 quintals per hectare because they were not able to apply mineral fertilizers on time -- the suppliers let them down.

Adoption of industrial technology is a complex and delicate matter. There are no small details in it. Diagrams, technological maps, and other documents must be carefully worked out at the brigade and team levels. Every person on the field must know his job precisely, since the schedules and quality of the work, particularly with herbicides, play the deciding role. In this connection the Moldavian experiment in which every mechanizer takes an exam after a course of study for the right to work with the new technology merits wide application.

It is important to avoid small organizational hitches so as not to compromise the long-term work. For instance, information is coming in that on the eve of mass field work some places are not ready to adopt the new procedures. According to specialists at the USSR Ministry of Agriculture, Voronezhskaya and Khersonskaya oblasts and Dagestanskaya ASSR are poorly prepared for spring in this regard. In Bashkiriya herbicides, specifically allocated for sunflowers, have been used on vegetables. Such practices can hardly have a good outcome.

Some partners of the agricultural workers are unfortunately moving slowly. The areas planned for crops to be cultivated by the new system have not been provided with fertilizers everywhere. Supplies of herbicides have been delayed in a number of cases. Other farms have not received the necessary machines. Chemists, machine builders, and enterprises of Goskomsel'khoztekhnika are called upon to devote all their efforts to fully provide kolkhozes and sovkhozes with everything they need and on time.

Comrade L. I. Brezhnev emphasized the necessity for perfecting production processes in the country and for stepping up the pace of agricultural industrialization and use of chemicals in his speeches to the July 1978 and November 1979 plenums of the CPSU Central Committee. Widespread adoption of industrial technology in agriculture is called upon to play a large role here. The last year of the five-year plan and the year of the Lenin jubilee must become an appreciable step in this program.

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TILLING AND CROPPING TECHNOLOGY

GROWTH RETARDANTS USED ON BELORUSSIAN GRAIN

Minsk SEL'SKAYA GAZETA in Russian 23 Apr 80 p 2

[Article by A. Shipovskiy, senior scientific associate of the Belorussian Scientific Research Institute of Agriculture and candidate of agricultural sciences: "Apply TUR and Kampozan"]

[Text] Under conditions in Belorussia winter crop sowings annually lodge over considerable areas with resulting harvest losses of up to 20 percent or more. This has been demonstrated by production experiments.

Growth regulators are becoming of great significance in increasing resistance to lodging. TUR is most effective for wheat sowings, and Kampozan is most effective on winter rye. They slow plant growth and development. Full ripening of these crops treated with the chemicals occurs 3 to 5 days later than untreated sowings. The stalk length to a considerable degree determines resistance to lodging. The effect of growth regulators is to cause the stalk to be up to 20 percent shorter and to increase the resistance of the sowings to lodging. Plants treated with TUR and kampozan, if they lodge at all, do so just before the harvesting. Without such treatment they lodge in the shooting or heading stages.

The yields of wheat and winter rye have increased markedly through their greater resistance to lodging. For example, application of TUR to wheat produces an increment of 3 to 7.6 quintals per hectare.

In 1975 the effectiveness of the new chemical kampozan was tested on winter rye sowings under production conditions in various rayons in Minskaya Oblast. Results showed that plant resistance to lodging increased considerably, and yields rose 3.5 to 5.8 quintals per hectare.

Increased yields from the application of TUR and kampozan are chiefly obtained by improvement in grain forming, formation of a large number of productive stalks per unit of land area, and reduction in losses during the harvesting. The use of regulators increases the amount of grain per head, although its length and the number of kernels remain almost unchanged.

It is necessary to begin to apply TUR to wheat and Kampozan to winter rye at the beginning of the shooting stage, when the first internodes appear and the plant is 25 to 40 centimeters high. The sowings should be watered in good sunny weather. The most favorable period for treating the sowings lasts about 10 days. Subsequent cultivation with surface equipment is undesirable because of mechanical damage to the sowings. It has been established that the most dependable increments to the harvest are produced by an application of 4 kilograms of the active ingredient TUR and 3 to 4 liters of kampozan per hectare. The application of smaller amounts in separate years does not assure good plant resistance to lodging. The yield usually depends on the level of control. When using surface equipment for spraying, it is necessary to expend 150 to 300 liters of working solution per hectare, but in aerial spraying the amount of liquid should be reduced to 50 liters per hectare.

To prepare a working solution in the sprinkler tank it is necessary to pour the water in first, followed by the required amount of chemical. Rubber gloves should be worn while the solution is being prepared. The eyes must be protected from the spray. If the chemical comes in contact with the surface of the skin, it must be washed with large amounts of soap and water.

Sowings should be treated when the crops are growing on fertile soil and the danger of lodging is foreseen. To apply TUR and Kampozan successfully it is necessary to determine now the area to be treated and to acquire the amounts of the chemicals needed by the farm.

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